S. Hrg. 99-55

FRAMEWORK AND ANALYSIS FOR AGRICULTURAL POLICY IN 1985

HEARINGS

BEFORE THE

COMMITTEE ON AGRICULTURE, NUTRITION, AND FORESTRY UNITED STATES SENATE

NINETY-NINTH CONGRESS

FIRST SESSION

ON

STRUCTURE OF AGRICULTURE; LOAN RATES, TARGET PRICES, SUPPLY MANAGEMENT, AND PRODUCTION CONTROLS; IMPACT OF TECHNOLOGY AND RESEARCH; CAPITAL INVESTMENT, DEBT, CREDIT, AND TAXES; AND CRITICAL ANALYSIS OF AGRICULTURAL POLICY OPTIONS

MARCH 12, 14, 19, 20, AND MAY 1, 1985

Printed for the use of the
Committee on Agriculture, Nutrition, and Forestry

U.S. GOVERNMENT PRINTING OFFICE
45-995 O
WASHINGTON : 1985

5161-20

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FRAMEWORK AND ANALYSIS FOR AGRICULTURAL POLICY IN 1985

Structure of Agriculture

TUESDAY, MARCH 12, 1985

U.S. SENATE,
COMMITTEE ON AGRICULTURE, NUTRITION, AND FORESTRY,
Washington, DC.

The committee met at 10:08 a.m., in room SR 328-A, Russell Senate Office Building, Hon. Jesse Helms (chairman of the committee) presiding.

Present: Senators Helms, Zorinsky, Melcher, Pryor, and Heflin.

STATEMENT OF HON. JESSE HELMS, A U.S. SENATOR FROM NORTH CAROLINA

The CHAIRMAN. The committee will come to order.

Today's hearing is the first in a series of five designed to study and assess the impact farm programs and policies have had on the American agricultural industry.

Now, without question, the decisions Congress will make about farm policy in this year's farm bill will have direct and measurable consequences for farmers and ranchers and for everybody else involved in the food and agricultural industry in the United States, and these decisions will have indirect consequences as well. Yet, surprising as it may seem, Congress has never really tried to assess those consequences before it has undertaken the writing of farm bills, at least not since I have been in the Senate.

Now, one witness before this committee's initial hearing last week said as much when he testified that the United States simply does not have a thought-out food and agricultural policy. Instead we have sort of a hodgepodge of farm programs that have been placed one on top of the other year in and year out. The decisions that Congress has made concerning the farm programs have had much to do with what is regarded as politically desirable on a commodity-by-commodity and issue-by-issue basis. But now, after a half dozen such efforts in recent years, we have a farm policy that simply does not work when combined with other aspects as a whole.

Today, farm policy has become inflexible and internally inconsistent with all manner of economic signals to farmers and governments all over the world, which no one really intended, and the result is that farm income is down 27 percent, our share of world agricultural trade has plummeted from 60 percent down to 50 percent of total trade, and the cost of farm programs to the taxpayers have increased five or sixfold.

I heard some Senators suggest last week that this is the fault of the Secretary of Agriculture. The charge was made that everything would be fine, or at least that was the implication, except that the Secretary has mismanaged, it was said, the farm programs Congress has written.

With all due respect to my colleagues, and I do respect them, I reject any such suggestion as that. The real problem is that Congress has never given any attention to what it was accomplishing in the economic and structural sense with the various farm bills that we have passed. Instead, Congress has appeared to assume that farm bills operate in some sort of vacuum without economic and structural consequences on farmers and agribusiness people and the population as a whole.

But despite the inattention Congress has given to these economic and structural consequences, they are there, and they are very real. Today, this committee will attempt to explore just exactly what it is that Congress actually accomplishes with farm programs. It would be interesting to learn. There are more than 2,400,000 farmers in America, and the farm programs impact some farmers a great deal, but many of them not at all, or only indirectly. It is simply a mistake to view all 2,400,000 of those farmers and ranchers as one big single mass of equal nature, equal structure.

Indeed, the very uniqueness of American agriculture is its incredible diversity. So our goal today, I hope, is to explore this diversity and to try to reach an understanding of just how farm policies and farm programs impact on the various segments, sectors, and elements in our farming and ranching and our agribusiness system in America.

Senator Melcher.

STATEMENT OF HON. JOHN MELCHER, A U.S. SENATOR FROM MONTANA

Senator MELCHER. I am just going to make a few comments.

When the President vetoed the farm credit bill, he seemed to go out of his way to talk down to American agriculture. He said, among other things, that we could not afford to spend several billion dollars over the next several years for farm assistance. That is an outright misrepresentation of the fact.

The new money that was in the bill was only $100 million. There was another $75 million that was in the bill in addition to that as a writeoff of those guaranteed loans that did not prove out over the next several years. That figure does not come from me. It comes from CBO and it comes from OMB. It is sort of a melting of their methods of figuring loan guarantees, and that was on the amount of about 2 billion dollars' worth of loan guarantees.

Whatever the President was talking about as costing several billion dollars over the next several years is a mystery to me. What is insulting is that the facts are wrong. He is telling the American public that the farmers had sort of run a raid on the Treasury. That is not the case at all.

Then the President seemed to be talking down to farmers in another misrepresentation when he said 4 percent of them were in serious trouble. That has been corrected by the Secretary of Agriculture and others who said that the President understands that that is not the exact figure, that it is around 8 to 9 percent. That is a far cry from 4 percent.

But be that as it may be, let me respond, Mr. Chairman, to what you brought up this morning about mismanagement of the Secretary of Agriculture.

I think John Block is a very fine person and I think he is a fairly good administrator of most business things. But to say he has not mismanaged during the last 4 years would be ridiculous.

What is the PIK Program if it was not an outright mismanagement of 12 billion dollars' worth of Government funds? It must have accomplished something. I thought it had accomplished something for cotton. The cotton people tell me now it has put them in a desperate bind. I do not know enough to comment any further than that on cotton. But I can tell you what it did for wheat. It did not improve the price. It reduced the production for 1983 by a very tiny percent.

Out of that total $12 billion, about $2 billion was spent on wheat. That is a pretty expensive buydown for about 150 million bushels less production, if that was the object of PIK.

That was the Secretary's mismanagement. This Senate never passed a PIK bill, so a PIK bill never passed the Congress. A lot of people had the idea that Congress somehow passed the PIK bill. We did not. The House did. The Senate did not.

There is another matter that ought to be discussed as mismanagement by Secretary Block, and that is section 416. He simply has not implemented it on any wheat since we passed the broadening legislation last April. Not one bushel of wheat has gone under section 416 on any donation program, any barter program, or anything in building trade for the future through that program using wheat. That is mismanagement.

The Secretary himself admits that. I asked him last week about it. He had to turn to one of his assistants to find out. I am not faulting him for that. The Secretary of Agriculture cannot be directly up to date on every last single program that is run by the Department. I do not blame him for not understanding it. But that is not the point.

He is sitting there as Secretary of Agriculture, and time after time myself and others have gone directly to the Department of Agriculture and said can we do something with section 416. We are constantly told no. Some of these others are the charitable institutions like CARE, CRS, Bread for the World and others, asking why they cannot use section 416 in their programs on assisting the hungry and the starving abroad. We have done that time after time in the past several months, and the Department still has not moved on it. They could have moved on it. They should have moved on it. They should have used wheat, and helped the people who are starving, helped these private voluntary organizations so they have a little more flexibility. It would be less expensive for the PVO's to make an application for food aid to the starving.

Those are the people it would help, and this Secretary simply has not taken upon himself to manage that program properly.

The third one I want to bring up on mismanagement is the Farmers Home Administration. That is in a terrible state of mismanagement. I thought maybe my State was unique. Maybe somehow we had too many disasters, and too many applications for these disaster loans that the Farmers Home Administration takes care of. But I hear from other Senators that their States are in disarray and all the applications are stacked up. Farmers Home Administration has not gotten through it. At the very time when we need more out of the Farmers Home Administration than usual, they are about 10 times further back. The applications are piled up and they have not worked them out yet.

Finally, the Secretary is taking some action as we start talking about farm credit prices. He starts to put on more employees. In my own State the Farmers Home Administration asked in the middle of January if the State Administrator for the Farmers Home Administration needed any more help. He said he did not think so. He did not know whether he would get any if he did need more help. He tried to keep the group he had working diligently with the pileup of the work they have. I think he was told he probably could not get help. I think after we got started in the farm credit crisis, the Secretary did act by putting more people out there. But I think it took him a long time, and I think that is mismanagement.

These are just three areas. I am not going to be harder on this Secretary than any other. Secretaries of Agriculture have a difficult time. All of them. Secretary Block, however nice a guy he is, has simply mismanaged on these three areas. There is no way of getting around it.

Thank you, Mr. Chairman.

The CHAIRMAN. Well, let me say this. Monday morning quarterbacking is just fine and we all engage in it around this place. I remember the day that the PIK announcement was made and we met over in the Dirksen Building in a hearing room, and I remember all the Senators were gathered there and they were so proud. Here was something being explored as a possibility. I had my doubts about it because I do not know how you can give away things. They call me Senator No, because of my position on so many of these programs that do not work and have never worked. It is fine to Reagan-blast and Block-blast; go on after them, that is fine. But it is our duty now not to decide who is right and who is wrong, but what is right for the farmers and the American people.

If we want to get into the political aspects of it, I can tell you, Senator, that it was not Ronald Reagan who put on that grain embargo. It was not John Block who sat by and let it happen. Ronald Reagan took off that embargo, and if you think back and be just a little bit fair about it, you will realize that grain embargo hit the farmer and left the rest of the economic spectrum alone, and that was my objection to it. If we had a total embargo, that would have been one thing. But to pick out the farmers and isolate them to bear the burden, that was wrong.

But I hope that after we get through with our opening statements, we could turn to what can we do to strengthen and make more viable the agricultural system in this country, the policies, the programs and so forth, and I hope this committee will continue to be bipartisan, nonpartisan, and I pledge to you, sir, my effort in that direction.

Senator Heflin.

Senator Heflin. I have no prepared statement.

The Chairman. Thank you very much.

Senator Zorinsky.

STATEMENT OF HON. EDWARD ZORINSKY, A U.S. SENATOR FROM NEBRASKA

Senator Zorinsky. Mr. Chairman, a devastating financial crisis is confronting many of our Nation's farmers. I am concerned that this crisis could result in irreversible damage to our family farm system of agriculture.

The future structure of American agriculture—how farming is organized, who controls it, and where it is heading—will be greatly influenced by how the credit crisis is resolved.

For example, the Department of Agriculture estimates that 368,000 farmers—accounting for 58 percent of the nearly $215 billion in total farm debt—have debt-to-asset ratios that indicate severe financial stress. Much of the debt that is owed by these financially troubled producers is owed to rural banks.

According to the Federal Reserve, over 4,000 banks have farm loan portfolios in excess of 25 percent of their outstanding loan volume. For many rural communities, when the financial integrity of the town bank is threatened—the economic well-being of the entire community is jeopardized.

It is clear that the economic forces adversely affecting agriculture could be the cause of an economic disaster for all of rural America.

The 1985 farm bill provides Congress and the administration with an opportunity to strengthen the farm and rural economy. In addition, a workable farm bill will maintain the diversity of American agriculture, protect our family farms, and promote an agricultural system that will use our national resources wisely. These are the key objectives to be considered when we discussed the future structure of agriculture.

I look forward to reviewing the testimony of today's witnesses.

Mr. Dunlop. Mr. Chairman, we thought we would call all the witnesses together.

The Chairman. As a panel?

Mr. Dunlop. As a panel.

The Chairman. Very well.

We have Dr. J.B. Penn, who will sit in Bob Dole's seat. He is in Geneva, I understand.

Dr. Penn is president of Economic Perspectives, Inc., of McLean, VA.

Dr. Don Paarlberg, professor emeritus, Purdue University, West Lafayette, IN.

Dr. Kenneth R. Farrell, director of the National Center for Food and Agricultural Policy, Resources for the Future, Washington, DC.

We welcome you, gentlemen, and thank you so much for giving of your time and your knowledge. We need both. Someone was talking the other day about the wisdom in Washington, DC, and I said all wisdom does not reside in Washington, DC. Some mornings I have difficulty finding any at all.

But we are delighted to have you, and I presume that you will proceed in order with your statements. I reiterate the admonishment of the staff director about using the microphones, putting the microphones close so the reporter can hear. She is nodding and smiling so she appreciates that too.

Very well. You may proceed.

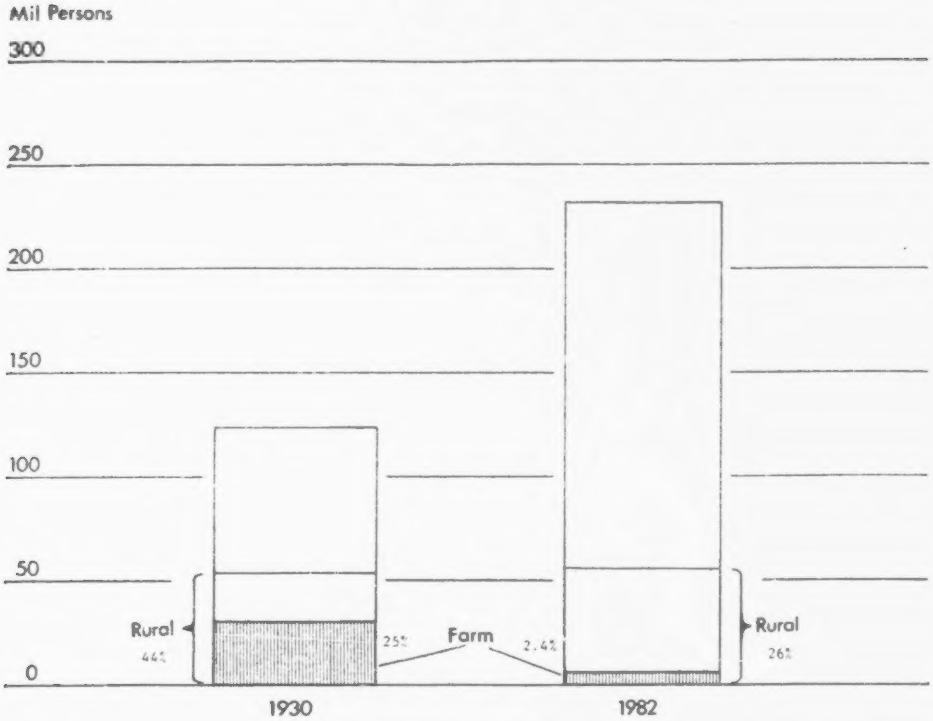
STATEMENT OF DR. J.B. PENN, PRESIDENT, ECONOMIC PERSPECTIVES, INC., McLEAN, VA

Dr. PENN. Thank you, Mr. Chairman.

I have no prepared statement. At the request of the committee staff, I have prepared some dozen and a half charts and tables that relate to the structure of agriculture, the topic of today's hearings. With your concurrence, I will very briefly summarize the points from the charts and tables that I think are most relevant to today's subject.

They address four important areas related to structure: The place of farming in the rural economy and in the national economy; the structure of the farm sector itself; the importance of foreign markets; and farm program costs and the distribution of benefits across the various farm sizes. I will proceed briefly through the charts.

Chart 1. Total, Rural, and Farm Populations of the United States



The first one, chart 1, indicates the total population of the United States in two different time periods, 1930 and 1982, and shows the relative importance of the farm population in those periods. In 1930, we had about 132 million people in this country; 57 million, 44 percent of the total population, lived in rural areas, 25 percent of the total population was farmers.

In 1982, we had about 233 million in the country. The rural population was about 60 million, 26 percent of the total population. The farm population is only 2.4 percent of the total, and only about 10 percent of the rural population. So we have had a substantial shift in the numbers of farmers and the number of people residing——

Senator Heflin. Could we interrupt to ask some questions as we go along?

Do you have any idea, comparing 1930 to 1982, as to the percentages of farm ownership? We have gone through a period of mechanization and labor displacement, which a lot of industries today are faced with this problem, and you have to plan for it. We have seen a shift. It may well be that some of the basic industries of the country that are faced with problems will learn from agriculture and profit from it. Is there any type of data to show the percentage of farm ownership as compared to the rural population.

Dr. Penn. I do not know the answer to that, Senator.

In 1930, we had roughly 6 million farms, and most of those were relatively similar in size and other characteristics. I would think that most were individually owned.

Senator HEFLIN. There existed a policy to encourage farm ownership, and there are a lot of people who own farms today as a result of those policies.

Are there any comments you might make on that? We have gone through the period of the thirties to the present time with substantial increases in ownership, and now we may be declining from that ownership and maybe moving toward larger and fewer farms.

Dr. PENN. We did have a large number of sharecroppers and tenant farmers during that period, and there have been Government programs to encourage ownership. The Farmers Home Administration and its predecessor agencies have all been oriented to that.

Senator HEFLIN. Federal land buying?

Dr. PENN. Yes; encouraging farmers to be able to own and operate their farms, but I do not have any of the statistics.

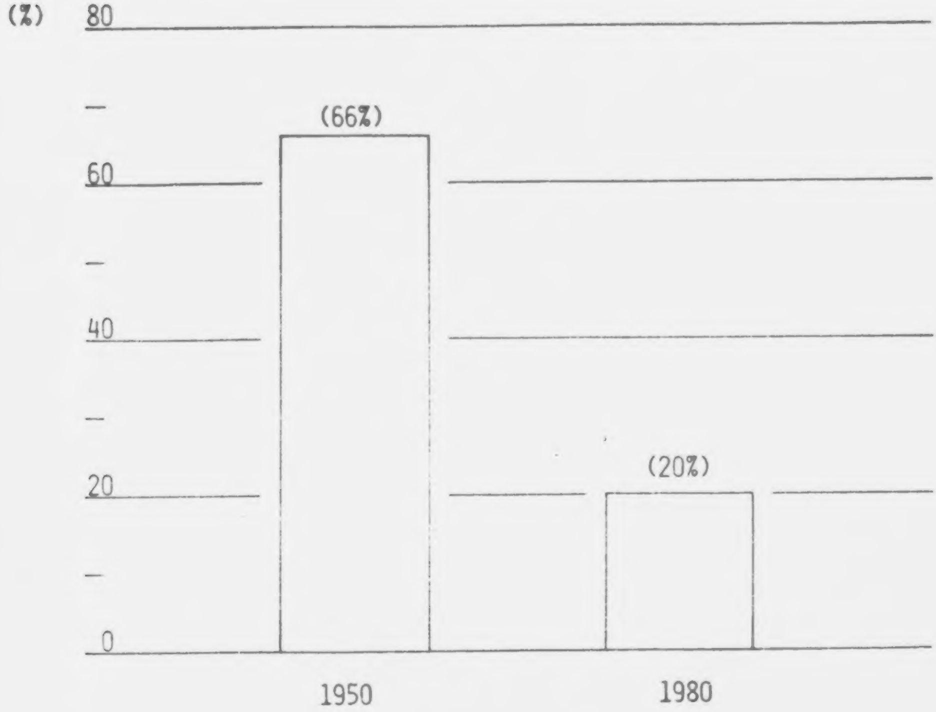
The CHAIRMAN. It is a good question you ask and I would like to know the answer to it, or ask them to go to the computer and see what they can find out.

Senator HEFLIN. I do not know if it would help in the long run. But when you realize that basic industries today have a major problem with labor displacement, and I do not think agriculture has that problem any more, it is worth looking at from a historical view.

The CHAIRMAN. Good point.

Dr. PENN. That concludes the first chart.

CHART 2. FARMING IN THE RURAL ECONOMY



1950 - FARMING ACCOUNTED FOR AT LEAST 20% OF THE ECONOMIC ACTIVITY IN 2,016 OF THE 3,042 COUNTIES--66%.

1980 - FARMING ACCOUNTED FOR AT LEAST 20% OF THE ECONOMIC ACTIVITY ONLY IN 600 COUNTIES--20%.

The second chart attempts to show the importance of farming in the rural economy, as a component of the rural economic base. Studies done by the Department of Agriculture show that in 1950 farming accounted for at least 20 percent of the economic activity in about 66 percent of all of the counties in the United States. By 1980, the most recent year for which data are available, farming accounted for at least 20 percent of the economic activity in only about 600 counties, about 20 percent of all of the counties in the United States.

The point is not that farming has declined in economic importance, but that other activities have become more important to the economic base in rural areas: The growth of light industry, the growth of the services sector. There has been a general expansion of economic activity in rural areas that causes the relative importance of agriculture to decline.

The next two charts are relatively——

Senator **Heflin**. You would say basically farming has stayed fairly steady, but it is the relationship where growth occurs in other nonagricultural areas?

Dr. **Penn**. Yes.

The next two charts [3 and 4] try to put farming into some perspective in the national economy. These two pie charts show the amount of economic activity and employment that is attributable to the broadly defined food and agricultural system. These data are for 1982. For the total gross national product of the economy of over $3 trillion, farming together with all of the related industries, the input supplying industries, the manufacturing and servicing industries; all of the food industries; plus textiles, leather, and tobacco, account for about 20 percent of that.

Farming by itself accounts for only about 2.5 percent of the total gross national product. But when you put this entire, closely related system together, you get one-fifth of the total economic activity and essentially the same amount in employment. In 1982, the labor force of the economy was 112 million people. This food and agricultural system accounted for 24.2 million, 21.5 percent of the total employment. Farming itself, the production sector itself, accounted for only 2.7 percent of the total.

I think these four charts show that we have seen an overall decline in the relative importance of farming to the economic base of rural communities, but we have seen growth in what could be called the food and agricultural system of the total economy. A lot of the functions once performed on the farm have been spun off and now are accounted for by other activities in the rural economy.

Senator **Melcher**. It is not clear to me what figure is agriculture.

Dr. **Penn**. The portion of that block on charts 3 and 4 labeled "farming."

Senator **Melcher**. Let us go to chart 4 first because that is the one I am looking at.

How much of the employment is attributable to agriculture, either directly or indirectly?

Dr. **Penn**. In the context of the whole food system, about one-fifth of the total employment of the labor force.

Senator **Melcher**. How do you find that on that chart?

Dr. **Penn**. You see the portion of the chart that shows 12½ percent of the total employment of this food and agricultural system attributable to farming. That is about 3 million people.

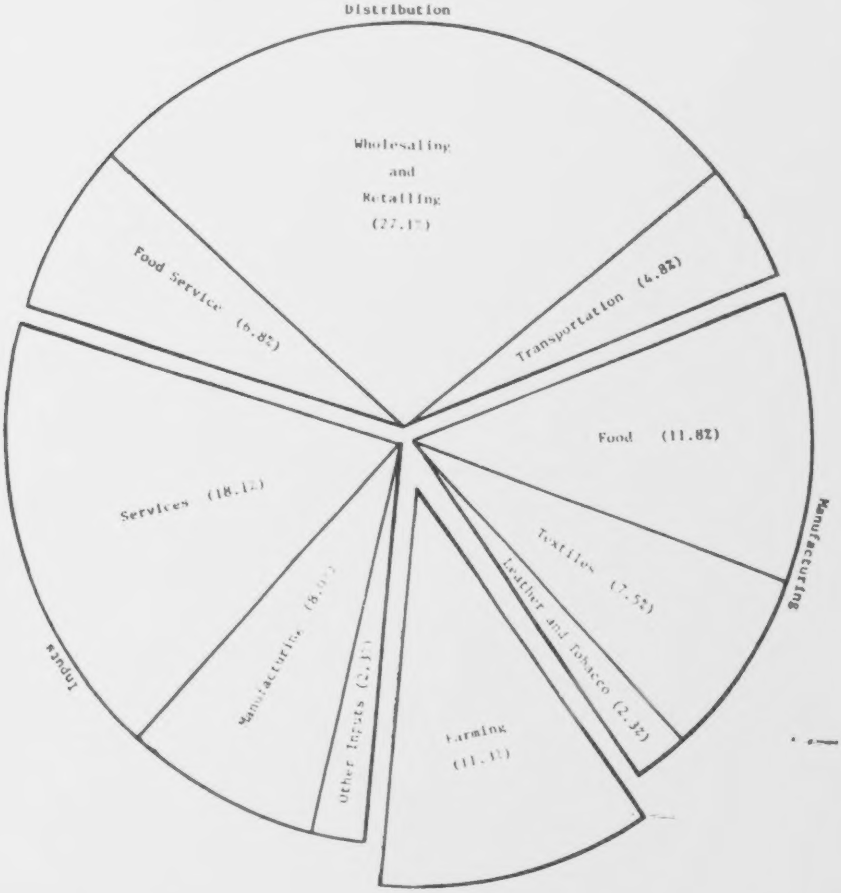
Senator **Melcher**. Where is the 20 percent?

Dr. **Penn**. That is for the entire system, for the whole circle. That is about 20 percent of the entire work force. In 1982, we had 112 million people employed in the labor force in this country. For this entire system, employment is 24.2 million people. That is about 21 percent. For farming itself, you have about 3 million people employed.

Senator **Melcher**. I guess what throws me is I cannot see where you find out that this represents 20 percent of the work force.

Dr. **Penn**. Those figures are not on there. They should have been appended.

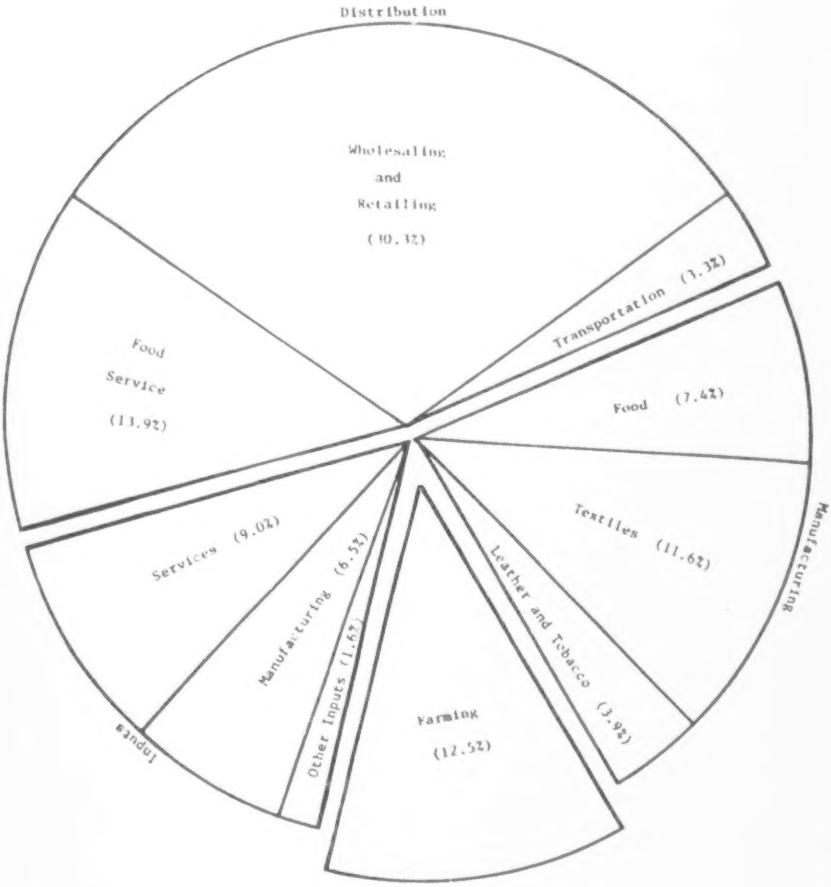
CHART 3. CONTRIBUTION OF FARM AND FOOD SYSTEM TO GROSS NATIONAL PRODUCT, 1982



Total GNP	$3,073	
Food and Agriculture System	$627	20.4% of GNP
Farming	$ 78	12.5%
Inputs	$107	17.1%
Distribution	$298	47.5%
Manufacturing	$144	22.9%

Source: Alden C. Manchester, "The Farm and Food System: Major Characteristics and Trends," The Farm and Food System in Transition; Emerging Policy Issues, a series of leaflets published by Michigan State Cooperative Extension Service, 1983.

CHART 4. CONTRIBUTION OF THE FARM AND FOOD SYSTEM TO EMPLOYMENT, 1982



Labor Force	112.4 million
Food and Agriculture System	24.2 million, 21.5 percent of total

Source: Alden C. Manchester, "The Farm and Food System: Major Characteristics and Trends," The Farm and Food System in Transition; Emerging Policy Issues, a series of leaflets published by Michigan State Cooperative Extension Service, 1983.

Senator HEFLIN. Let me ask you this on charts 3 and 4. I am a little confused.

Looking at food on chart 3, you have 11.8 percent. You do not include—is that not included in farming? What is the distinction there? I can see food service and the others. How is food distinguished from farming and distinguished from food service?

Dr. PENN. The portion of that chart that is labeled "farming," the 11.3 percent, is production agriculture. That is the actual production of the raw product. All of the rest of this chart represents what happens to the product when it leaves the farm, all the way to final consumption, plus all of the input supplies that have to go into production of the raw product.

Senator HEFLIN. I am still confused with the chart that says food, 11.8 percent. What is that? How do you distinguish that from food service and farming? Is it not produced on the farm? How is it distinguished from manufacturing or something else? Is it food processing?

Dr. PENN. Yes, sir, I am sorry. There is a label left off that side. You see the farming block, the next three blocks which are other inputs, manufacturing and servicing, those are farm inputs, the input suppliers to the farmer; the next three blocks are distribution—food service, distribution, wholesaling, transportation; and that block about which you are asking is processing, manufacturing, and distribution of food, textiles, leather, and tobacco.

Senator HEFLIN. In other words, you start out with $1, and only 11.3 represents farming, and that has been added to the farming products under these various categories, the remaining amount of $1?

Dr. PENN. No; I do not think that is the way you would interpret that.

Of the total amount of economic activity that is generated by this entire circle, 11 percent is attributable to production agriculture. But if you are talking about the proportion of the consumer food dollar that goes to the farmer, that is about 30 percent.

Senator HEFLIN. Well, why the distinction? You have got value added. The 30 percent that you would say goes to the farmer from the consumer relates directly to the farmer if these value-added items go into it to make up 100 percent. Is the percentage in the dollar different? Is that the way it is?

Dr. PENN. Again, not exactly. That is because included in these data are leather, tobacco, and textiles. Some nonfood commodities are included in this.

Senator HEFLIN. Well, we are sort of following a separation of tobacco from other aspects of agriculture.

Senator ZORINSKY. How far in your estimation would the rest of the circle give without having available the 11 percent of the farming?

Dr. PENN. I think all the rest of it is dependent upon having the raw product. It is all part of an integrated system.

Senator ZORINSKY. If this is 21 percent of total GNP or the contribution to the national dollar, what percentage of the budget as opposed to the total budget of the country with this 11 percent be receiving? Do you have any numbers on that?

Dr. PENN. I do not, but I have seen some numbers from the Department of Agriculture. It is relatively small; 3 or 4 percent of the total budget of the United States goes to agriculture.

Senator ZORINSKY. Agriculture probably produces a higher percentage of gross national product than other parts of the economy even though USDA is a small part of the budget.

Dr. PENN. If you look at the farm sector specifically, it accounts for about 2½ percent of the gross national product, and it accounts for 3 or 4 percent of the national budget expenditures.

Senator ZORINSKY. And 75 percent of our exports are in some way directly or indirectly related to that, is that true?

Dr. PENN. I think about 20 percent of the total exports in the country are agricultural or farm commodities.

Senator ZORINSKY. Just 20 percent?

Dr. PENN. Of all the exports.

Senator MELCHER. Is that all of the commodities exported or are you including services?

Dr. PENN. I think that is goods.

Senator MELCHER. Goods and commodities?

Dr. PENN. Yes.

Senator MELCHER. Does it include services?

Dr. PENN. I am not sure whether it includes services or not.

Senator MELCHER. Did I hear Senator Zorinsky say this pie, No. 3, represents 21 percent of the gross national product?

Dr. PENN. Yes.

Senator HEFLIN. I want to ask you this. That value added is domestic?

Dr. PENN. Yes.

Senator HEFLIN. If you were to get into a—of course, you would have different figures for comparisons to gross national product. But if you go into the export market, your transportation is going to be substantially increased, would it not?

Dr. PENN. From the export of agricultural products?

Senator HEFLIN. Yes. If you were to separate the domestic market from export market, would not transportation be a much more significant factor?

Dr. PENN. I understand what you are asking. No; this total pie includes exports. It includes the processing and transportation of the exported commodities as well.

Senator HEFLIN. When we hear, for example, that the price of wheat—I do not remember the exact figures, these are all ball park—is about $2.60 a bushel, and the world market is $3.55, and we are told that the reason for that difference in Paris or somewhere else is transportation, which is almost $1——

Dr. PENN. I would think those numbers are not correct. The transportation for moving agricultural commodities from our ports, the gulf coast or the west coast, would average something more like $15 to $20 a ton for wheat to European ports, for instance. I do not know the exact numbers either, but $135 would be a ball park estimate for a ton of wheat.

Senator HEFLIN. What would it be on a bushel basis? I am not very good in mathematics.

Dr. PENN. I would guess that wheat at the Gulf of Mexico now would be——

Senator HEFLIN. To France.

Dr. PENN. Close to $4 delivered to the gulf, $3.75 to $4.

Senator HEFLIN. But I am saying what would be the cost of transportation on a bushel basis to deliver from the gulf coast to France?

Dr. PENN. I do not know.

The CHAIRMAN. It is out of your area of expertise.

Senator MELCHER. Thirty-five to forty cents.

Dr. PENN. Yes, 35 or 40 cents, somewhere in there.

Senator MELCHER. What you might have heard on why it was higher in Rotterdam was because there was an added price, added by the Common Market to bring the price up to what it is in the Common Market. That is about a buck and a half per bushel.

Senator HEFLIN. Go ahead.

Dr. PENN. That concludes the first element that I wanted to discuss, which is the setting of agriculture in the rural economy, and agriculture in the national economy.

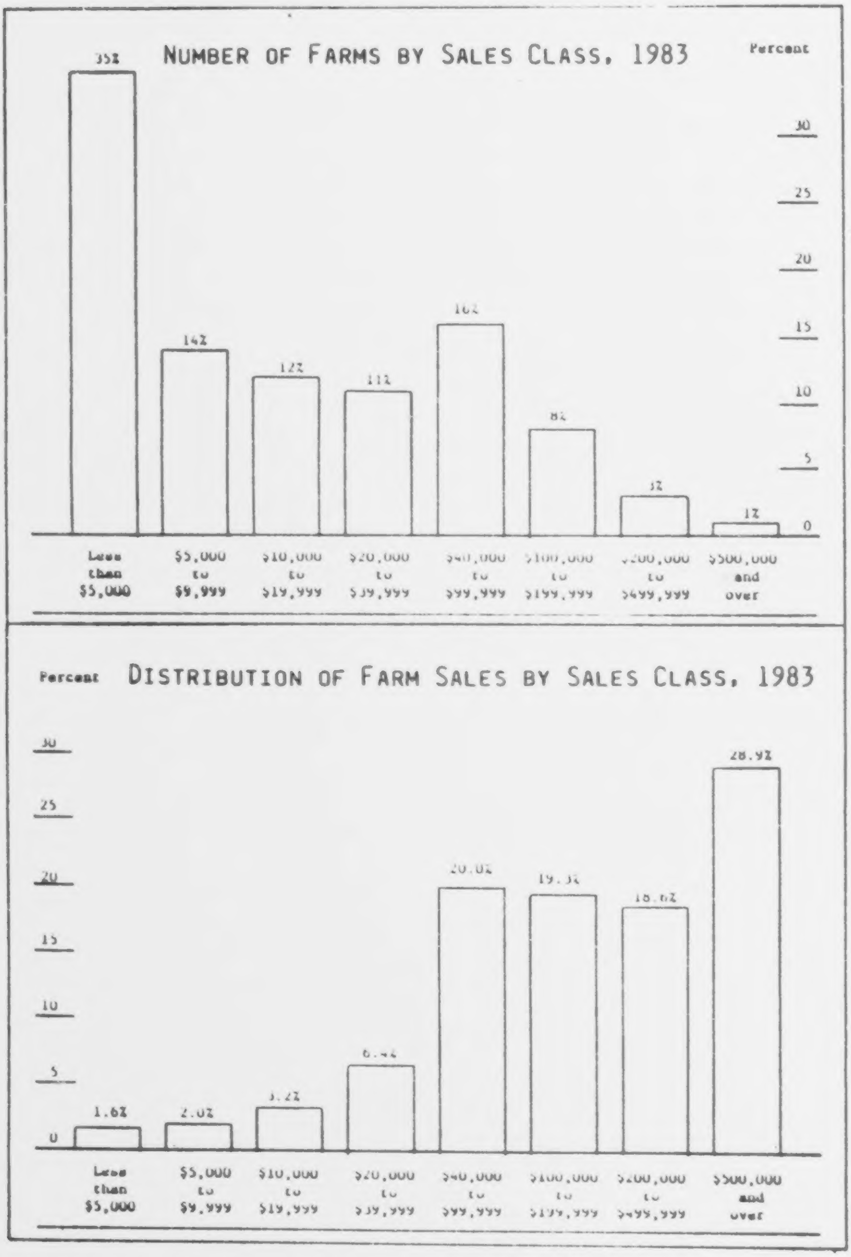
The next several charts talk about the structural characteristics within the farm sector itself.

Now, most of these numbers are well known to people in the farm policy community, and to agricultural experts, but I think it is useful to once again try to establish some common ground. I would start by noting that the official definition of a farm is any place that sells at least $1,000 of agricultural products in 1 year, and is located in a nonmetropolitan area.

By that definition we have, as the chairman has indicated, about 2.4 million farms today. These farms can be categorized in any number of ways: By acre size, or by sales size, or by the amount of labor that is involved. The conventional way, and the way for which we have the most information, is by sales size.

Chart 5 shows the farms distributed by size, and size here being defined as the amount of gross sales. You can see that of the 2.4 million farms, 35 percent have less than $5,000 in gross sales. As the sales size increases, the numbers decline, until you reach about $40,000, and then there is a slight increase.

CHART 5. DISTRIBUTION OF FARMS



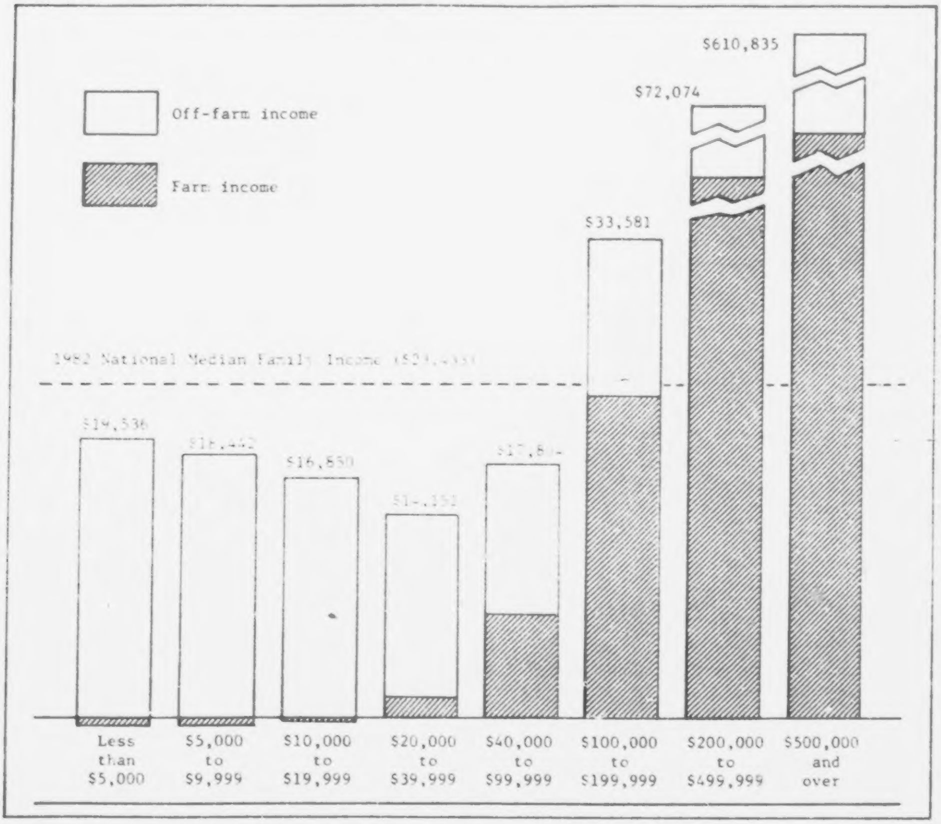
Source: Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983, ECIFS 3-3, Economic Research Service, USDA, September 1984.

The revealing point is to compare the numbers of farms with the amount of sales that they generate.

There are 1.7 million farms that have less than $40,000 gross sales and those farms account for only 13 percent of all of the farm output. These are about 700,000 farms, 28 percent of all the farms, that generate about 87 percent of all the output. We have a relatively highly concentrated farm production sector.

Chart 6 shows the average farm operator income by sales class. As Senator Helms has indicated, the programs have been operated for almost 50 years with the major focus of the programs being to improve the incomes of farm people.

CHART 6. AVERAGE FARM OPERATOR FAMILY INCOME BY SALES CLASS, 1980-83



Source: Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983, ECIFS 3-3, Economic Research Service, USDA, September 1984.

It is important, I think, to compare the income for the farms of various sizes. Each bar of this chart has two components. One shows the amount of income that farm people earn from nonfarm sources, and the other the amount of income they earn from the farming operation. The white portion of those bars is off-farm income, and the shaded portion is farm income.

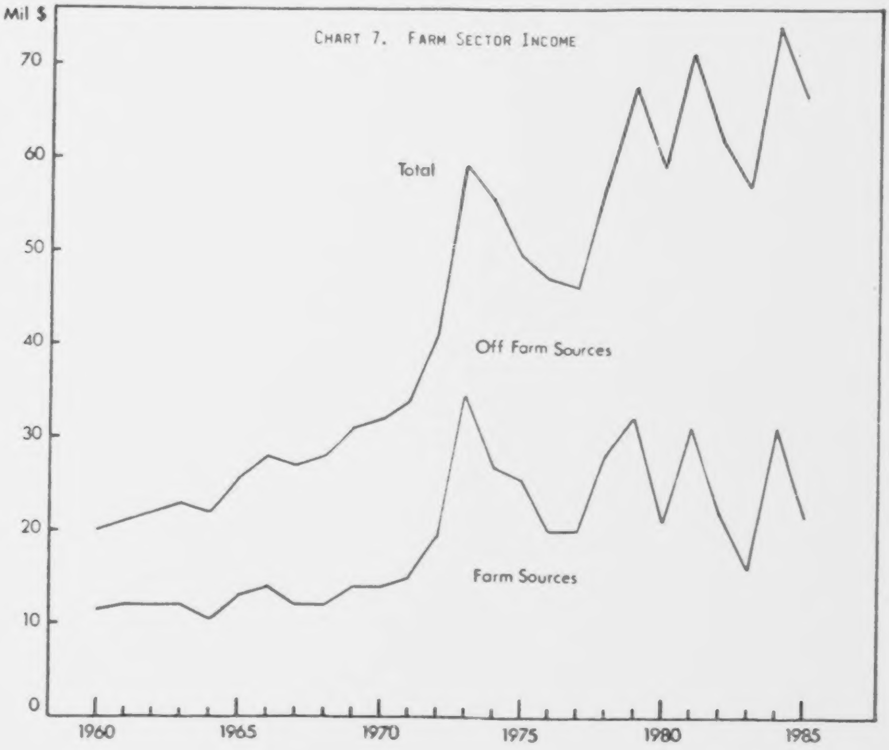
Another point that becomes relatively clear from the chart is that the first four categories, farms with less than $40,000 in gross sales earn very little of their family income from farm operations. In fact, the first three size groups actually lost money during 1980 to 1983.

I also might mention that these numbers are averages for the 4 years, 1980 to 1983, just to avoid having 1 year being atypical. The average income for each of the size groups is shown in relation to the national median family income, which in 1982 was $23,433. You can see that the average for the small farms, those with less than $40,000 sales, is about $17,000 to $18,000, whereas the average for the larger farms is $40,000 or more. The average for the very largest farms in this country, the ones that have over $500,000 gross sales, is $600,000 per year.

Senator HEFLIN. Do you have anything that would indicate what return on equity is on those bars and charts?

Dr. PENN. I do, and it is shown on one of the later charts.

The next chart [chart 7] simply shows the total income that is earned by people in the farm sector, the amount that comes from farm sources versus off-farm sources. This is a very important chart, I think, for policy purposes. Since the early sixties, the first time such statistics were collected, the amount of income earned by farm people off-farm has grown tremendously, while farm income grew very slowly until the 1970's, and then, of course, more rapidly for awhile, and it has been relatively stable since.



Off-farm employment opportunities, the ability for farm people to earn income from nonfarm sources, probably did more to solve the farm problem than all the commodity programs put together. I think that is a very important development in the structure of American agriculture.

The next chart, actually is table 1, labeled "Farm Characteristics by Size," examines the concentration in agriculture, to give some notion of the relative importance of the various size farms.

TABLE 1. FARM CHARACTERISTICS BY SIZE, 1983

ITEM	LARGEST OF ALL FARMS				REMAINING 71.9% OF ALL FARMS
	1%	4.5%	12%	28.1%	
			- - PERCENT - -		
PROPORTION OF OUTPUT	28.9	47.5	66.8	86.8	13.2
			- - DOLLARS - -		
AVERAGE GROSS SALES	1,803,000	665,000	352,000	195,000	11,600
AVERAGE NET FARM INCOME	562,000	174,000	82,300	41,200	240
AVERAGE TOTAL INCOME	590,000	192,000	96,300	53,700	19,400
AVERAGE ASSET VALUE	4,289,000	2,295,000	1,564,000	1,045,000	197,000
AVERAGE NET WORTH	2,653,000	1,561,000	1,135,000	790,000	171,000
			- - PERCENT - -		
% OF SECTOR DEBT HELD	18.3	36.6	56.7	79.1	20.9

SOURCE: USDA.

One percent of all of the farms in this country, about 25,000 farms, have gross sales of at least $500,000. They produce 29 percent of all of the agricultural output. Their average sales in 1983 were about $1.8 million. Their average net income from farm sources is $562,000. Their average total income is $590,000, and the average value of their assets is $4.3 million. Their average net worth is $2.7 million. They account for about 18 percent of the total debt of the farm sector.

The other columns in that table show the characteristics, for the largest 5 percent of the farms, the largest 12 percent, and the largest 28 percent. The fourth column to the right shows the characteristics for what I would call the commercial farms, those with at least $40,000 in gross sales. As you know, a farm that sells only $40,000 in products in a year is not a very large farm, but those farms account for 28 percent of the total number of farms. They produce 87 percent of all of the output. Their average sales are $195,000. Their average net farm income is $41,000.

When you add income from nonfarm sources, the total averages almost $54,000. Their average assets exceed $1 million, and their average net worth is $790,000. They hold almost 80 percent of all of the farm sector debt. That is 28 percent of all of the farms, largely the commercial farm sector in this country today.

The remaining 72 percent of the farms are—I do not know what you call them—noncommercial farms perhaps, or hobby farms, or part-time farms, but they are the relatively small ones. On the average, these 1.7 million farms earned in 1983, $240 in farm income, but their average total income was $19,400, largely from off-farm employment, wage and salary income, earned by members of the farm family from outside the farm.

Senator MELCHER. Dr. Penn, is this calender year 1983?

Dr. PENN. Yes; it is.

Senator MELCHER. How do you get the $41,000 net farm income off gross sales of $200,000?

Department of Agriculture figures are always worth looking at to see how they compute them.

How do you explain the average net income is $41,000 on sales less than $200,000? Do you not question these figures?

Dr. PENN. No. I think these are reasonably accurate. This includes all farms that have $40,000 or more of gross sales. That is everybody from the farm that has only $40,000 in sales, all the way through to the large farms that have several million dollars in sales.

When you average across all of those farm sizes, you get an average income of $41,000.

Senator MELCHER. Every farm that has the average gross is $195,000, so we are not talking about anything but an average gross, and you are arriving at $41,000, which is a 20-percent return.

You can strike my State out unless somebody picked 1983 to get a whole bunch of PIK payments. Is that included?

Dr. PENN. Yes.

Senator MELCHER. Why do we not take that out?

Dr. PENN. We do, in a later chart. We take those payments out in a later chart.

Senator MELCHER. This is the payment for nonproduction.

Dr. PENN. That is what the PIK payments were. But this is $200,000 in gross sales, almost, and all of agriculture averages about 20 percent net from gross. That is $40,000 on $200,000 gross sales.

Senator MELCHER. They do not in my State. Maybe this is the explanation. The $195,000 gross would not include any PIK?

Dr. PENN. That is gross sales, but the income——

Senator MELCHER. Perhaps an individual might have a PIK payment of $400,000, and still sell some barley, even though he got a PIK payment for wheat. He might sell maybe some cattle, or something, and still come up with $200,000. And still he would have a $400,000 payment for not growing wheat that year.

Do you think maybe that is what explains that rather radical figure in there?

Dr. PENN. No. I think the diversity of agriculture explains what you call the radical figure.

Senator MELCHER. Why would anyone choose 1983, admittedly a terrible year, to try to figure out anything on wheat or corn, or cotton, because of the huge PIK payments which totally distorted it?

Dr. PENN. That is exactly right. One would not, except that those are the most recent data available. I have included them in this chart, but in all of the previous charts we looked at, I averaged 1980, 1981, 1982, and 1983 for that very purpose, so that you could not say that one particular year is atypical, and distorts the picture.

Senator **Melcher**. It makes this year worthless on wheat, corn, and cotton, and maybe some other crops. Do you have another year on which you can draw conclusions?

Dr. **Penn**. I think so.

Senator **Zorinsky**. If they make 20 percent net income on those gross sales, why are they having trouble meeting their financial obligations?

Dr. **Penn**. That is the average for all of agriculture, and all of agriculture includes not——

Senator **Zorinsky**. Why, in your estimation—20 percent is a reasonable profit.

Now, why in your estimation, can they not meet their obligations? Why are we having bank failures as a result of nonpayment of payments by the farmers to the banks?

Dr. **Penn**. These numbers, first of all, are averages. If the average farmer earns 20 percent net from gross sales, then they would not be having very much trouble meeting their debt repayment.

The farmers that are having those difficulties, are, in my view, particular situations. They are the farms that are heavily debt encumbered, and they have a large debt repayment, exacerbated by the high interest rates, in addition to meeting current operating expenses.

Senator **Zorinsky**. But many of them are making 20 percent, and if they were, they could save themselves.

Dr. **Penn**. That is true.

Senator **Melcher**. Unless you have got something more to show us, I question, Doctor, whether you have directly assessed and worked out the case on the Department of Agriculture figures.

Whenever we have to deal with USDA figures, I always have to find out who worked them out. They always have some stuff that is not relevant.

I can guarantee you that the farmers and ranchers in this country, that I know of, that had $200,000 gross sales, do not make $40,000.

Dr. **Penn**. Well, I think you can find individual cases where that is true. You can also find a lot of cases where it is not true.

When you look across all of agriculture, at the crops sector, at the livestock sector, at all of the other sectors of agriculture, and you put all the numbers together, that is what the averages show.

You can look at wheat farms, and find different situations, or cotton farms, or other kind of farms, but I think these numbers are reliable.

Senator **Heflin**. Let me ask you this. You go on about the relationship of the percentage of net income to the gross sales. Under the 1 percent, I figure you are just roughly 17 to 18 percent. On 4.5, about 19. On 12 percent, 21 percent, and on 28.1 of the large farms, $41,000, that is about 23 percent.

As the size of the farm decreases, is there a better percentage relationship between net income and gross sales?

Dr. **Penn**. As it decreases, or increases?

Senator **Heflin**. As the size of the farm increases, at least the percentages of this would appear——

Dr. **Penn**. I see what you are asking. No, it should be the other way around, if you are looking at an individual farm. I think the larger the farm gets, the wider the margin gets, the wider the net, but these are averages, lumping all of these farms together.

Senator HEFLIN. But they are in a—when you start out 1 percent, and your next column is 2.5, the next is 12, and the next is 28, and as your percentages of relationship of net income to gross sales, they seem to increase, the smaller the farm goes.

Dr. PENN. I think it goes the other way, does it not?

On average gross sales of $1.8 million, the net is $562,000. I do not have a calculator, but that must be what, 30 percent? It is about 30 percent, whereas for the 28.1 percent of the farms, the net is only about 20 percent. I think as the farm size gets larger, the net usually increases.

Senator ZORINSKY. Dr. Penn, is not the differential between the average total income and the average net farm income the cost of doing business, or the cost of the operation during a calendar year?

Dr. PENN. The differential?

Senator ZORINSKY. Between $41,200 and $53,700. One is net, and one is total income, as opposed to net farm income, which means the difference represents the cost of doing business.

Dr. PENN. No. That includes—let us make sure we are talking about the same thing.

The $41,200 that you referred to, and the $53,700, that differential is income from nonfarm sources. The $41,000 is income earned from the farming operation, and then you add in any family income, coupon clipping, income from other sources, and you get to the $53,700.

Senator ZORINSKY. I see. OK. Where is the gross farm income, then?

Dr. PENN. That is the $195,000.

Senator ZORINSKY. That is the sales, not income.

Dr. PENN. That is the gross sales.

Senator ZORINSKY. Where is the gross income? The gross amount of dollars that the product is sold for is $195,000, is that correct?

Dr. PENN. Yes.

Senator ZORINSKY. How would you determine the cost factor of operating the farm, or doing business? It is a figure above—a differential that brings it down to the $41,200.

Dr. PENN. Yes. Yes; it would be the difference. It would be $195,000 less $41,200.

Senator HEFLIN. Would you tell me what the total figure of the total gross sales and the total net farm income was that you used? You had to have a total figure.

Dr. PENN. In 1983, the gross sales of agriculture were about $150 billion, and the net income in 1983 was about $20 billion, roughly. I cannot remember the exact numbers. That is roughly it.

The CHAIRMAN. Let me interject here. These statistics are not irrelevant to me, because what we are looking at is the total agricultural picture in this country, and that includes the people who do not get subsidies, the whole ball of wax.

But I do not want us to get so bogged down in statistics that we eat up the time of the other two gentlemen, Dr. Paarlberg and Dr. Farrell.

But I do not want to cut off the Senators on their questions, either.

So let me suggest—I saw you nodding your head two or three times, Dr. Paarlberg. Please feel free to interject, and make your comments, as well. I think that will be helpful to all of us.

So all three of you, please join in.

Now you may proceed.

Dr. PENN. Well, I will speed this process up. We do not want to get bogged down in numbers, because I think we are losing sight of the bigger picture.

The next table [table 2] simply shows the net income from farm and nonfarm sources, for what I have called the commercial-noncommercial farm. This is for 4 years. You can see that the commercial farms, those with over $40,000 in sales, averaged something like $46,000 income over that 4 years, net income, whereas the smaller farms averaged something on the order of $18,000 net income per family, and most of that from nonfarm sources.

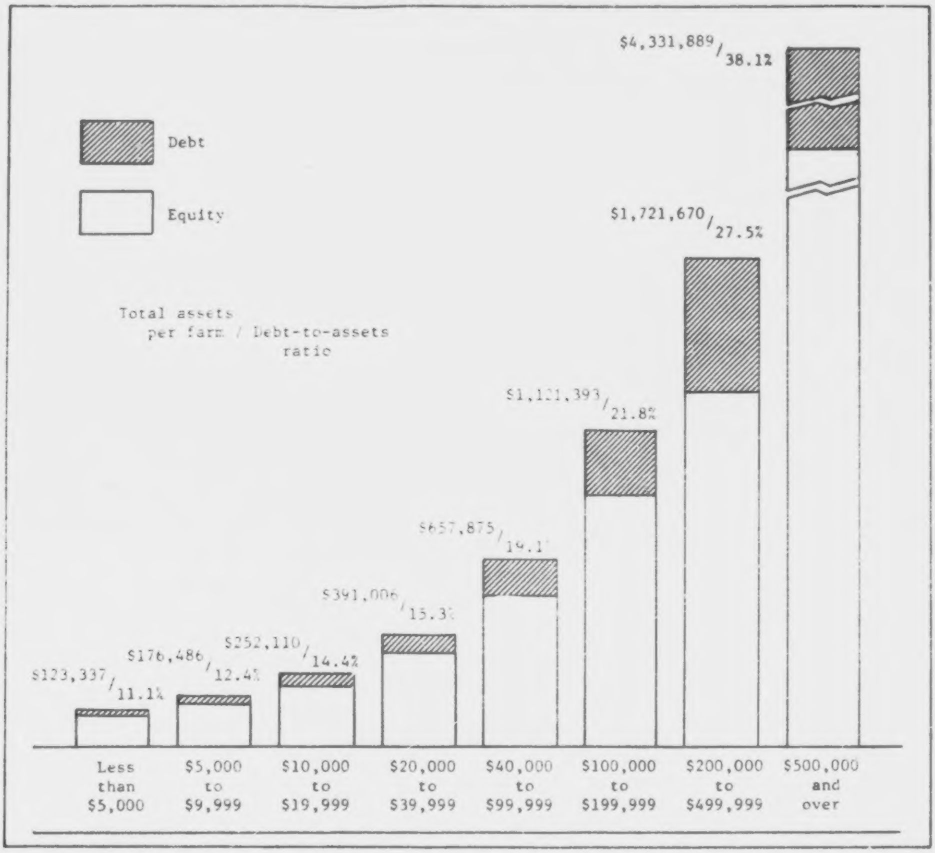
TABLE 2. INCOME OF COMMERCIAL AND NONCOMMERCIAL FARMS

YEAR	FARM	NONFARM	TOTAL	AVERAGE PER FARM
	- - BILLION DOLLARS - -			DOLLARS
		COMMERCIAL		
1980	22.2	7.3	29.5	43,635
1981	31.1	7.8	38.9	57,158
1982	23.3	8.1	31.4	45,446
1983	17.1	8.3	25.4	38,217
		NONCOMMERCIAL		
1980	-0.9	30.3	29.4	16,770
1981	-0.2	32.0	31.8	18,190
1982	-0.9	31.3	30.4	17,760
1983	-1.0	32.7	31.7	18,580

SOURCE: USDA.

The next chart [chart 8] is a balance sheet of the farming sector for various farm sizes. This shows the amount of debt, the amount of equity, and the total assets of the various farm sizes.

CHART 8. BALANCE SHEET OF THE FARM SECTOR (INCLUDING FARM HOUSEHOLDS) BY SALES CLASS, JANUARY 1, 1984



Source: Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983, ECIFS 3-3, Economic Research Service, USDA, September 1984.

The shaded portion is the average amount of debt. The nonshaded portion is equity, and the height of the bar is the total asset value.

To choose one as an example, those farms that have between $100,000 and $200,000 in gross sales have an average asset value of $1.1 million, and their debt is something on the order of $250,000. They have a 21-percent debt-to-asset ratio, about the average for the entire agricultural sector.

The debt-to-asset ratio is much higher for some farms, and very much higher for other farms, as we know. The debt-to-asset ratio also increases as the size of the farm increases, as the chart shows.

I think that overall you can see that a debt-to-asset ratio of about 21 percent for the sector suggests that the fundamental health of the entire farm sector is relatively good. This is not to say that in some of these particular size categories some farms in some areas are not experiencing severe difficulty, those with very high debt-to-asset ratios.

But overall I think you have to conclude that the farm sector is relatively healthy.

Senator MELCHER. Dr. Penn, I suspect that you are going to be basing these charts on what we have already covered. You cannot make a statement like you just made without understanding whether or not this table 1, "Farm Characteristics by Size, 1983," is basically right, or has any relevancy.

Let me ask you a couple of questions.

Average net farm income of $41,200 on average sales of $195,000—which is a figure I find very difficult to believe—does that include an amount for the value of living in the home, on the farm, or ranch?

Dr. PENN. Yes.

Senator MELCHER. What is that?

Dr. PENN. What is the average rental value? I do not know. There are imputations in the farm income account that include two things: The value of living in the home dwelling, and agricultural products that are used on the farm. I think those are relatively small numbers.

Senator MELCHER. Well, I do not know. We are trying to understand this chart.

As I said, when I look at the Department of Agriculture figures, I look at all the assumptions they make. What kinds of things are they assuming? The assumptions made by the Department are sometimes relative to facts, and sometimes are irrelevant to facts.

Dr. PENN. I understand, Senator, but the farm income accounts conducted by the Department of Agriculture are part of the national income accounts. Those concepts, and those data collection procedures have been examined by all sorts of people, and they are commonly accepted as being a professional way to do this.

Now we are arguing with averages. We can argue about my interpretation of these numbers, but I think the basic statistics in themselves are as good as we can get, and they are certainly not altered for political purposes from year to year.

Senator MELCHER. I am not saying for political purposes.

Dr. PENN. Or whatever.

Senator MELCHER. I think in some things there is some relevance to meritorious discussion of their tables. I happen to think this one is irrelevant, but since you are going to base the rest of your findings on it in these other tables——

Dr. PENN. The rest are not based on this. This is the income picture, and the others are the balance sheet statistics.

Senator MELCHER. Was any comparison done by any sampling of tax returns?

Dr. PENN. No.

Senator MELCHER. How about bank statements, where they list assets compared to liabilities, and what your income was on that?

Dr. PENN. No.

Senator PRYOR. A question on this chart [chart 8]. The equity, in achieving the equity percentage, is that the price of land? Is that the land value as of today, 1 year ago, or 2 years ago?

Dr. PENN. January 1, 1984. This would reflect land values in 1983.

Senator PRYOR. The land values would then relate to the equity part of the chart, is that correct?

Dr. PENN. Yes.

Senator MELCHER. Is this USDA?

Dr. PENN. Yes.

Senator PRYOR. Thank you.

Dr. PENN. I will speed this up. We will skip table 3, since it contains the same information as on chart 8.

Going quickly to table 4, I would draw your attention to the three columns on the right, which show the rate of return to equity investment from current income, capital gains and the total. This relates to something that Senator Heflin asked earlier.

TABLE 3. FARM BALANCE SHEET BY VALUE OF SALES CLASS, JANUARY 1, 1984

Sales Class	Percent of			Debt-to-Asset Ratio	Per Farm		
	All Farms	Total Assets	Total Liability		Assets	Liabilities	Proprietors' Equity
				percent		- - dollars - -	
Less than $5,000	35.0	9.9	5.3	11.1	123,337	13,743	109,594
$5,000 - $9,999	13.7	5.6	3.3	12.4	176,486	21,952	154,535
$10,000 - $19,999	11.8	6.8	14.7	14.4	252,110	36,242	215,868
$20,000 - $39,999	11.4	10.3	7.6	15.3	391,006	59,788	331,217
$40,000 - $99,999	16.1	24.3	22.4	19.1	657,875	125,976	531,899
$100,000 - $199,999	7.5	19.3	20.1	21.8	1,121,393	244,084	877,309
$200,000 - $499,999	3.5	13.8	18.3	27.5	1,721,670	474,212	1,247,458
$500,000 and over	1.0	10.0	18.3	38.1	4,331,889	1,652,376	2,679,513
Total or All-Farm Average	100.0	100.0	100.0	20.8	435,120	90,591	344,529
$40,000 and over	28.1	67.4	79.1	24.4	1,045,156	255,353	789,803

Source: Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983, ECIFS 3-3, Economic Research Service, USDA, September 1984.

TABLE 4. RETURNS TO INVESTMENT EQUITY IN FARM PRODUCTION ASSETS

Period	Equity in Assets	Residual Income to Equity 1/	Real Capital Gains	Rate of Return to Equity Investment From		
				Current Income	Capital Gains	Total
	- - bil of 1967 dol 2/ - -			- - percent - -		
1940-44	89.7	6.46	5.68	7.2	6.3	13.5
1945-49	128.4	8.42	0.80	6.6	0.6	7.2
1950-54	144.0	6.48	0.43	4.5	0.3	4.8
1955-59	155.2	4.10	6.61	2.6	4.3	6.9
1960-64	173.3	5.38	5.42	3.1	3.1	6.2
1965-69	190.9	7.19	5.60	3.8	2.9	6.7
1970-74	206.1	11.77	13.54	5.7	6.6	12.3
1975-79	265.5	8.66	23.52	3.3	8.8	12.1
1980-83	281.8	3.74	-14.68	1.3	-5.2	-3.9
1979	300.9	10.14	10.83	3.4	3.6	7.0
1980	306.2	3.98	-1.83	1.3	-0.6	0.7
1981	299.5	6.24	-27.64	2.1	-9.2	-7.1
1982	272.5	3.43	-21.21	1.3	-7.8	-6.5
1983	247.6	1.34	-7.67	0.5	-3.1	-2.6
Mean 1940-83				4.3	3.3	7.6
Coefficient of Variation				0.55	1.60	0.85

1/ Residual income to equity equals total farm income returns plus net rent to landlords less returns imputed to operators' labor and management.

2/ Deflated by CPI.

Source: Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983, ECIFS 3-3, Economic Research Service, USDA, September 1984.

You can see that in most of the historicial period we have had a positive return from current income and capital gains, but beginning in 1980, and then in 1981, 1982, and 1983, we have had declining returns to capital gains. Those reflect the declines in land values, the most sustained, and the most serious decline in land values since the Depression. That has produced, in the right-hand column, the negative return to equity investment for all of agriculture of 7 percent in 1981, almost 7 percent in 1982, and 3 percent in 1983. So I think that is an indication of what is happening in the balance sheet situation.

The CHAIRMAN. What impact did inflation have, inflation going up and coming down have?

Dr. PENN. It has been taken out of those numbers. Those have been adjusted for inflation.

The next table, table 5, and chart 9 relate to the importance of exports. I think this is something that everybody now knows, that since the early 1970's we have become very, very dependent on export sales, and the decline that has occurred in the last 2 years. The 1985 forecasts now place the export value at $35.5 billion, which shows we lost a substantial share of our markets overseas since 1981.

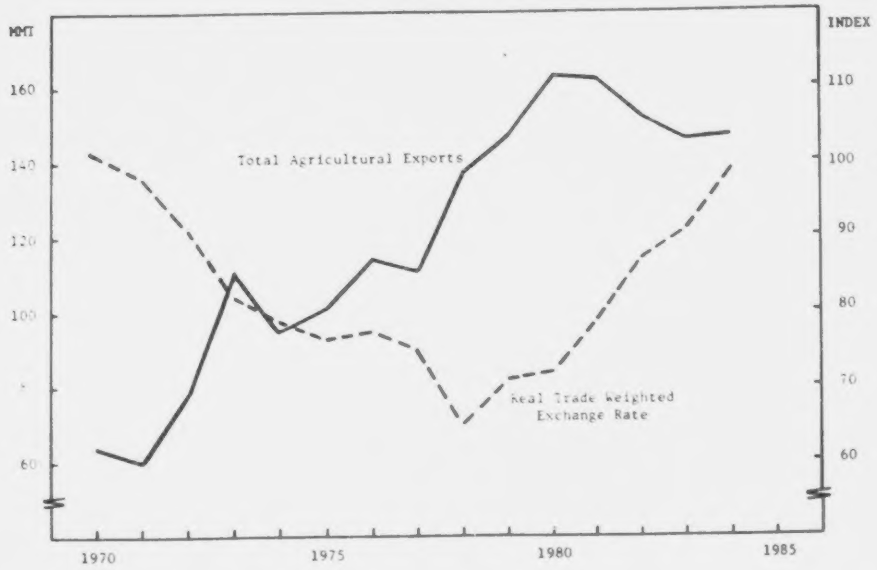
TABLE 5. U.S. AGRICULTURAL TRADE, VOLUME, AND VALUE

Calendar Year	Export Volume	Export Value	Import Value	Trade Balance
	million metric tons		- - million dollars - -	
1970	64.3	7.3	5.8	1.5
1971	60.3	7.7	5.8	1.9
1972	77.7	9.4	6.5	2.9
1973	111.2	17.7	8.4	9.3
1974	95.0	21.9	10.2	11.7
1975	101.0	21.9	9.3	12.6
1976	113.8	23.0	11.0	12.0
1977	110.7	23.6	13.4	10.2
1978	136.9	29.4	14.8	14.6
1979	147.3	34.7	16.7	18.0
1980	162.9	41.2	17.4	23.9
1981	162.4	43.3	16.8	26.6
1982	151.6	36.6	15.4	21.2
1983	145.6	36.1	16.6	19.5
1984	146.9	37.9	19.3	18.6

Source: U.S. Foreign Agricultural Trade Statistics Report, Calendar Year 1983, USDA.

Commodity	1981-82 Average Proportion Exported (percent)	Acre Equivalent (million acres)
Wheat	58.6	46.8
Corn	23.0	17.1
Cotton	46.6	5.0
Rice	44.9	1.6
Soybeans	43.4	29.5
Coarse Grains	22.1	24.1

CHART 9. U.S. AGRICULTURAL EXPORTS AND THE TRADE WEIGHTED VALUE OF THE DOLLAR, 1970-84



But I think the important part is at the bottom of the table, which shows for 1981 and 1982, the average proportion of the production of various commodities that were exported along with the acreage equivalent.

You can see about 100 million acres are involved, of the program commodities: wheat, corn, cotton, rice, soybeans, about 100 million acres involved in producing for export, about 1 of every 3 of the base acreage of the program crops.

Senator MELCHER. None of these figures have been adjusted for inflation?

Dr. PENN. No.

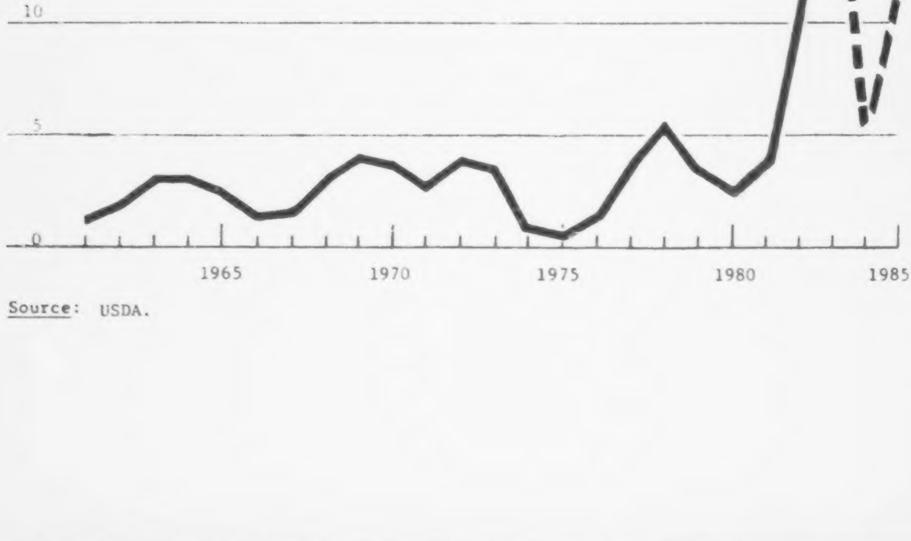
Senator MELCHER. Export value, 7.3, 1970, and purchasing power would be about 3 times?

Dr. PENN. A little less than 3 times. The CPI is about 2½ times what it was in 1967.

Chart 9, of course, is simply a plotting of the volume of our exports, and the real trade weighted exchange rate, taking into account the value of the dollar relative to the currency of those countries that are purchasing our imports. Of course, it too tells the story that most everybody knows, that as the exchange rate has continued to increase, the volume and value of our exports have declined.

The last two items, chart 10 and table 6 relate to net CCC outlays for farm support and related programs. Chart 10 also tells the story that everyone knows. The commodity programs cost an average of about $3 billion a year during the 1970's. Since 1980 they have averaged about $10 billion a year, over 3 times more.

CHART 10. NET CCC OUTLAYS FOR FARM SUPPORT AND RELATED PROGRAMS



Source: USDA.

TABLE 6. DIRECT GOVERNMENT PAYMENTS TO FARMERS BY VALUE OF SALES CLASS, 1983

FARM SIZE	PERCENT OF ALL FARMS	PERCENT OF TOTAL PAYMENTS	AVERAGE PAYMENT PER FARM	INCOME FROM ALL SOURCES	PAYMENTS AS % OF INCOME FROM ALL SOURCES
	(%)	(%)	($)	($)	(%)
LESS THAN $2,500	21.4	1.4	257	21,294	1.2
$2,500 TO 4,999	13.6	1.9	547	19,509	2.8
$5,000 TO 9,999	13.7	4.0	1,146	19,891	5.8
$10,000 TO 19,999	11.8	4.2	1,437	18,324	7.8
$20,000 TO 39,999	11.4	10.6	3,626	16,493	22.0
$40,000 TO 99,999	16.1	33.4	8,143	21,907	37.2
$100,000 TO 199,999	7.5	22.6	11,837	38,474	30.8
$200,000 TO 499,999	3.5	15.0	16,798	76,844	21.9
$500,000 AND OVER	1.0	6.9	26,805	596,187	4.5
TOTAL	100.0	100.0	3,922	29,048	13.5

NOTE: TOTAL PAYMENTS IN 1983 WERE $9.294 BILLION.

SOURCE: ECONOMIC INDICATORS OF THE FARM SECTOR: INCOME AND BALANCE SHEET STATISTICS, 1983, ERS, USDA, SEPTEMBER 1984.

Senator, I think this very last table relates to your interest in PIK. These data are for 1983. They are the direct Government payments that were made to farmers in that year. They totaled $9.3 billion, and you can see where they went across the various farm sizes. You can see that those farms that had, for instance, sales of less than $2,500 got an average payment of $257. Farms that had gross sales of $500,000 and over got an average of $26,800 per farm. These include the PIK payments.

But I think the important item here is the right-most column, which shows the payments as a percent of income from all sources. If you look, for example, at the farms with $40,000 to $100,000 gross sales, you will see that 37 percent of their income in 1983 was from the payments.

Now, because 1983 was so atypical, because of payments over $9 billion, as opposed to the more usual $3 billion, these numbers are inflated. But even in the other years I have examined, the pattern is the same. The distribution across the various farm sizes change very, very little.

Well, Mr. Chairman, that concludes my discourse on the charts, and I am sorry if we created any confusion. I think we can clarify it, if we have more time.

The CHAIRMAN. Please stay seated, Dr. Penn. I am sure some members are going to come back to you with more statistical questions.

Dr. Paarlberg.

STATEMENT OF DR. DON PAARLBERG, PROFESSOR EMERITUS, PURDUE UNIVERSITY, WEST LAFAYETTE, IN

Dr. PAARLBERG. Mr. Chairman, Senator Zorinsky, Senator Melcher, and Senator Pryor, ladies and gentlemen, I am very happy to be here.

I noticed I am sitting in Senator Lugar's seat. He is from Indiana. I am from Indiana. I am honored to be able to be here and to sit in this chair.

Our subject is farm structure, and in my statement I have addressed myself to a number of things that J.B. Penn has already spoken of, so I shall avoid duplicating that subject matter to the degree I can.

I am dealing more in terms of trends in structure, than I am in the structure itself, and I would like to tick off some of the major changes that have occurred in the structure of agriculture.

By structures, I mean the manner in which land, labor, and capital and management are put together to produce crops and livestock.

We have had a virtual agricultural revolution. Since 1930, that is, a little over 50 years, tractor-horsepower have increased 11 times. The farm output per man-hour of labor of agriculture has risen to 14 times what it formerly was. Acreage of land cultivated per farm worker has increased fivefold.

From 1930 to 1974, 33 million people have left agriculture. The tonnage of fertilizer used has increased 15 times. Crop production per acre, that is, yields, has more than doubled.

Since 1950, agricultural assets have increased 2¼ times in real dollars, that is, and to raise the necessary capital farm debt has increased in real terms about 5 times.

We are concerned with efficiency, which is output per unit of input. That has increased about 2¼ times in the last 50 years. Land holding has been much more concentrated.

In the north central States in 1978, three-tenths of 1 percent of the owners held 23½ percent of the land.

Now, these changes have affected both farmers and nonfarmers. Before these changes got underway, per capital income of farm people averaged only 37 percent as large as those of nonfarmers. In 1982 they had risen to 78 percent.

If you put this on a per family income basis, they were, in recent years, practically at the same level as incomes of nonfarm people.

Consumers have also gained from these changes; 50 years ago it took about 34 percent of personal consumption expenditures to buy food, and now that is down to 19 percent.

I will pass over some of the following material from my statement, because Dr. Penn has already discussed these things.[1]

Some things, though, I do wish to bring up, additional things.

Vertical integration has occurred. By vertical integration, I mean that more than one of the stages of production have been put under single management or ownership. Formerly the supplying of inputs, that is, fertilizer, fuel, et cetera, were in certain hands, farm production in other hands, marketing in other hands, processing in other hands, retailing in other hands. Now there has been vertical integration, and in recent years about one-third of agriculture has been, in this sense, vertically integrated, either by ownership or by contract. It formerly was so that we marketed the products competitively in central markets. That is on the retreat.

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[1] See p. 187 for the prepared statement of Dr. Paarlberg.

Incorporation, you hear much about incorporation of agriculture. We have family farm corporations. These are organized by the family, primarily to facilitate the transfer of the property from one generation to another. There are also some tax advantages.

Family farm corporations constitute about 1⅓ percent of all the farms. They control about 8 percent of the land in farms, and they produce about 9 percent of the farm product sales.

Now, there are some publicly held corporations that have come into agriculture. These are chiefly for specialty products, fruits and vegetables in California, poultry production in various parts of the country. Though these publicly held corporations are frequently cited as a threat to the traditional farm, they accounted, in 1974, and that was the most recent data available, they accounted for only six-hundredths of 1 percent of the farms, six-tenths of 1 percent of the land in farms, and about 3 percent of the farm product sales.

Farms are now more vulnerable than they used to be. It used to be that a farmer provided himself much of the labor, much of the fuel, much of the seed, and the other input items. Now he buys these items, and these are things that Senator Melcher was speaking of, so the margin between his costs and his gross, that has been squeezed, and as that is squeezed he becomes more vulnerable.

In a good year his income can be doubled. In a bad year it can be wiped out altogether.

The CHAIRMAN. Dr. Paarlberg, just for the purpose of emphasis, you passed over part-time farming statistics. I think you ought to give those, so everybody will understand what we are talking about.

Dr. PAARLBERG. It is particularly important in your part of the country, Senator.

The CHAIRMAN. Yes, sir.

Dr. PAARLBERG. In 1982, almost two-thirds of the income of people classified as farmers by the Census came from nonfarm sources.

Now, in your area, where there are off-farm employment opportunities, that is very important. In Montana, Senator Melcher, there are not equivalent off-farm employment opportunities, and there it is much less important.

Nationwide, in recent years, it has amounted to about two-thirds of the income of all agriculture.

The CHAIRMAN. But it is nearly two-thirds nationwide, on the average.

Dr. PAARLBERG. Nationwide, right.

Senator MELCHER. On how much production? How much production does that represent?

Dr. PAARLBERG. You mean how much production do these part time farmers produce?

Senator MELCHER. Yes.

Dr. PAARLBERG. Well, it is very low. I cannot give you the number, but as a percentage of the total, it is one digit, not two.

Senator MELCHER. It is insignificant?

Dr. PAARLBERG. It is very small.

Senator MELCHER. It is fair to say it is insignificant.

Dr. **Paarlberg**. What it says is these people are not served by the Commodity Program, because they do not produce for the Commodity Program. We call them farmers, because that is how the Census defines them, but farming is not really their livelihood. They are rural residents, with some supplementary farm income.

Now, there are sharp arguments about the causes of these trends. Clearly, in my view, the dominant cause is technology, which calls for increased size of operations, more capital, more sophisticated management. But institutional forces have had their effect. Tax policies and public credit programs have made for larger farms.

Research and education programs have been offered to the farmers cafeteria style, and they have been picked up more readily by the larger operators, and have speeded up rates of change.

There is disagreement as to the effect of the commodity programs on the size of farms. Most operators of big farms contend that the programs have no effect on farm size, but in the next breath they will say putting a low cap on Government payments per farm would result in a break up of large farms.

I myself am more persuaded by the second of these arguments than I am by the first. I think a fair summary of the issue is that whatever may have been the effect of the Commodity Programs, it was overwhelmed by the effect of other forces.

Now, trying to look at that, to anticipate what may be ahead, I have described these trends in the structure of agriculture, and I have attributed them mostly to advances in technology.

What do we see ahead for technology? If we can visualize that, we can picture what will be the trends in the structure.

Every indication that we have indicates that the revolution in agriculture has not run its course; that the rate of technology will, if anything, continue and perhaps increase. The Office of Technology Assessment has a study that I think they are going to lay before you gentlemen in just a few days which I think is an excellent study; and it undertakes to anticipate which sources of technology will be important in the years ahead and what the rates of increase would be in production per acre and per animal, and they anticipate the technology revolution pretty much staying on course. If that is true and unless there is interference of some kind, the trends I have described would largely continue.

Now, are these trends good or bad? There is a difference of view about this. Some people think they are good because they increase efficiency, make available abundant supplies of food at relatively low prices. Some people think they are bad because they place stress on individuals. We have moved some 30 million people off of farms in the last 50 years, and every one of these decisions was fraught with personal difficulty and immense adjustment problems; and the social stress associated with this revolution is in the minds of many people very great.

Some people say that with public policy we should try to slow down these trends. Other people say the public policy should keep hands off and allow the forces of competition to express themselves. Perhaps most people think that it should be the purpose of public policy to slow down these trends.

I address in the latter part of this statement some 10 or more different proposals that have been put forth by various people that allegedly might slow down the trends in farm structure that are under way. I have grouped these in two categories.

One are those that would be unlikely to reverse structural changes under way but have much public attractiveness and are in various forms before the body politic. One is to continue or increase farm price supports. Despite the purposes that appear to the preamble to the various agricultural statements, it is true that most of the benefits of commodity programs go to the larger farmers whose incomes are already above the farm and nonfarm average, and in my judgment serves to speed up the reduction in the number of farms and the increase in the average size. Price supports have not saved the family farms. Family farms are now by number about one-third what they were when these programs began.

Prohibit farming corporations; you hear this often.

As has been shown statistically, corporations are not a major rival to privately held farms and outlawing them would have little effect on trends previously discussed.

Prohibit vertical integration and contract farming, some people suggest this. But to outlaw vertical integration and contract farming would be to deprive farmers of an assured home for their products with known terms of sale. It is hard to see how this would affect farm structure for the better.

Prohibit the purchase of land by nonfarmers; we hear that proposal. With farms increasing in size and the capital needs growing, investment per farm grows very large and so large as to be out of reach for all but those in specially-favored family circumstances.

Ownership of land by nonfarmers and the intelligent leasing of land to farm operators is a way of helping young men get started. Ruling out this possibility is to eliminate a remedy, not an ailment.

Cheap credit. Much of agriculture's present problem is the result of easy credit and excessive borrowing during the late 1970's and early 1980's. It is hard to see how openhanded credit would solve a problem that it in part created, nor would it slow the trends discussed earlier, particularly since however subsidized credit is intended, most of it winds up in the hands of the big farmers. That is indicated by Dr. Penn's figures.

Government purchase of land and lease thereof to farmers, individual farmers. This is proposed and some States have initiated small-scale programs of this sort. It has attractiveness as a way of helping young farmers to get started. It would give Government an opportunity to influence structure but not without complication. Government would interpret to whom farming opportunities would be granted and from whom they should be withheld. It would reverse the land policies of most of American history.

Now, I address another group of proposals. These are proposals that have real teeth in them, that would change structural trends, that would slow them down. If there is sincere intent to slow down or reverse the trends in agriculture, there are ways of doing it.

No. 1, a progressive tax on farmland would reverse or check the trend toward fewer and larger farms. It would relate to accumulated wealth in land much as the progressive income tax relates to the annual flow of wealth.

No. 2, tough inheritance laws. Instead of making it easier to pass large farms intact from one generation to another, as was the purpose and effect of recent legislation, such taxes could be increased with the objective of breaking up large farms. This would require sale of part of the land to pay the tax and would give a young man a chance to buy land and start farming.

No. 3, change other tax laws. Various institutional arrangements favor the large farmers. These are cash basis accounting, preferential taxation of prospective capital gains, deductibility of interest on borrowed funds, investment tax credits, and several methods of computing accelerated depreciation. All of these give subtle preference to big farmers, who use enormous amounts of capital. These tax provisions could be withdrawn.

No. 4, targeting Government programs. Instead of relating farm program benefits to the number of bushels produced, which favors the larger farmers, they could be targeted to those farmers in the middle range of size, described earlier in this testimony.

No. 5, and the last one, reorder research and extension. The trends previously documents are mostly the result of technology. New technology results from research and education. Research and education, about half of which are funded by the public, have speeded the substitution of capital for labor and contributed to the observed trends. If research and education were shifted away from high technology toward intermediate or low technology, the trends could be slowed. This would mean curtailing basic research, helping develop farming systems for small and part-time farmers and working with cooperatives that pool buying and selling power for farms of small or moderate size.

Now, the gist, Mr. Chairman, of this testimony is as follows:

No. 1, structural changes are so profound as to constitute a veritable revolution.

No. 2, they have deep-seated causes, the dominant one being technology which, if anything, seems to be accelerating.

No. 3, the structural changes are on balance a cause of public concern.

No. 4, there are effective ways of slowing or reversing these trends, but they are so unattractive that they are unlikely to be adopted.

No. 5, and finally, we are likely, therefore, to continue our ambivalent course, continuing to promote those changes by our public policies but nevertheless lamenting them for their social effects, real and alleged.

That concludes my statement, Mr. Chairman.

The CHAIRMAN. A very fine statement, Dr. Paarlberg.

Some of your proposals under the category of unlikely to slow or reverse structural changes now under way, at least two of them I do not believe could be done constitutionally, but that does not inhibit people from recommending it to me. I hear it all the time. You have got to do so and so. But it would hit the courts and out it goes.

Under the proposal that would change structural trends, a progressive tax on farm real estate, tough inheritance laws, when the Congress passes that sort of thing I want 24 hours' notice so I can get out of town. I can imagine the onslaught.

No. 2, tough inheritance laws. Instead of making it easier to pass large farms intact from one generation to another, as was the purpose and effect of recent legislation, such taxes could be increased with the objective of breaking up large farms. This would require sale of part of the land to pay the tax and would give a young man a chance to buy land and start farming.

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Under the proposal that would change structural trends, a progressive tax on farm real estate, tough inheritance laws, when the Congress passes that sort of thing I want 24 hours' notice so I can get out of town. I can imagine the onslaught.

So let me suggest—I saw you nodding your head two or three times, Dr. Paarlberg. Please feel free to interject, and make your comments, as well. I think that will be helpful to all of us.

So all three of you, please join in.

Now you may proceed.

Dr. PENN. Well, I will speed this process up. We do not want to get bogged down in numbers, because I think we are losing sight of the bigger picture.

The next table [table 2] simply shows the net income from farm and nonfarm sources, for what I have called the commercial-noncommercial farm. This is for 4 years. You can see that the commercial farms, those with over $40,000 in sales, averaged something like $46,000 income over that 4 years, net income, whereas the smaller farms averaged something on the order of $18,000 net income per family, and most of that from nonfarm sources.

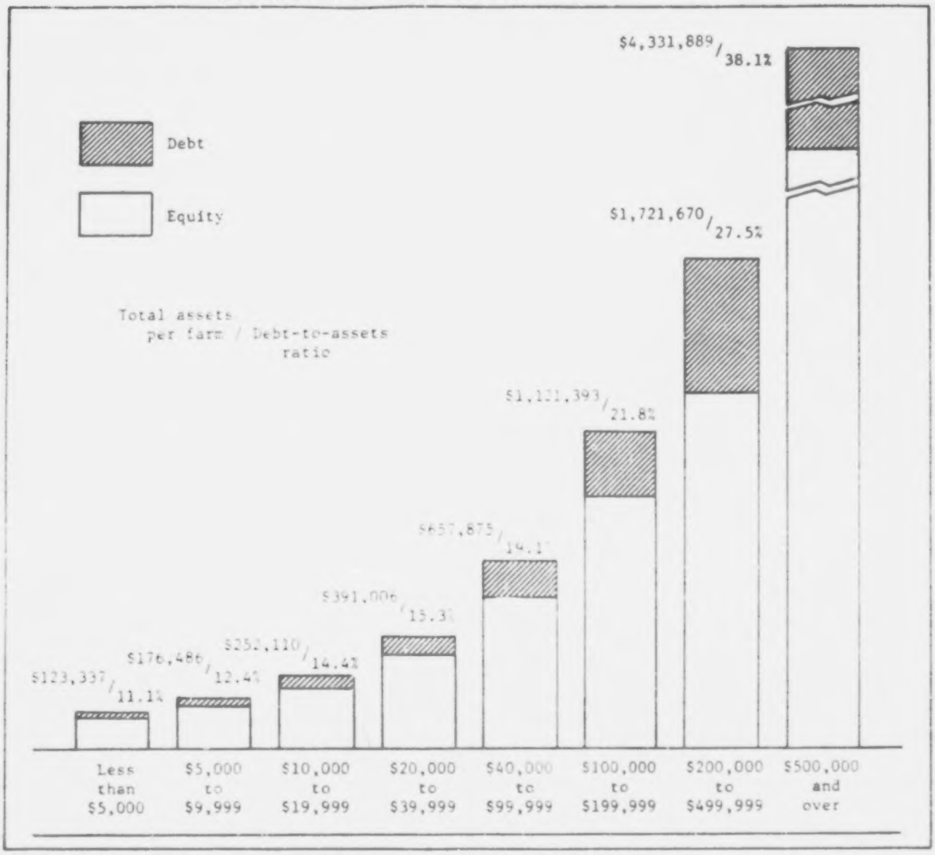
TABLE 2. INCOME OF COMMERCIAL AND NONCOMMERCIAL FARMS

YEAR	FARM	NONFARM	TOTAL	AVERAGE PER FARM
	- - BILLION DOLLARS - -			DOLLARS
		COMMERCIAL		
1980	22.2	7.3	29.5	43,635
1981	31.1	7.8	38.9	57,158
1982	23.3	8.1	31.4	45,446
1983	17.1	8.3	25.4	38,217
		NONCOMMERCIAL		
1980	-0.9	30.3	29.4	16,770
1981	-0.2	32.0	31.8	18,190
1982	-0.9	31.3	30.4	17,760
1983	-1.0	32.7	31.7	18,580

SOURCE: USDA.

The next chart [chart 8] is a balance sheet of the farming sector for various farm sizes. This shows the amount of debt, the amount of equity, and the total assets of the various farm sizes.

CHART 8. BALANCE SHEET OF THE FARM SECTOR (INCLUDING FARM HOUSEHOLDS) BY SALES CLASS, JANUARY 1, 1984



Source: Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983, ECIFS 3-3, Economic Research Service, USDA, September 1984.

The shaded portion is the average amount of debt. The nonshaded portion is equity, and the height of the bar is the total asset value.

To choose one as an example, those farms that have between $100,000 and $200,000 in gross sales have an average asset value of $1.1 million, and their debt is something on the order of $250,000. They have a 21-percent debt-to-asset ratio, about the average for the entire agricultural sector.

The debt-to-asset ratio is much higher for some farms, and very much higher for other farms, as we know. The debt-to-asset ratio also increases as the size of the farm increases, as the chart shows.

I think that overall you can see that a debt-to-asset ratio of about 21 percent for the sector suggests that the fundamental health of the entire farm sector is relatively good. This is not to say that in some of these particular size categories some farms in some areas are not experiencing severe difficulty, those with very high debt-to-asset ratios.

But overall I think you have to conclude that the farm sector is relatively healthy.

Senator MELCHER. Dr. Penn, I suspect that you are going to be basing these charts on what we have already covered. You cannot make a statement like you just made without understanding whether or not this table 1, "Farm Characteristics by Size, 1983," is basically right, or has any relevancy.

Let me ask you a couple of questions.

Average net farm income of $41,200 on average sales of $195,000—which is a figure I find very difficult to believe—does that include an amount for the value of living in the home, on the farm, or ranch?

Dr. PENN. Yes.

Senator MELCHER. What is that?

Dr. PENN. What is the average rental value? I do not know. There are imputations in the farm income account that include two things: The value of living in the home dwelling, and agricultural products that are used on the farm. I think those are relatively small numbers.

Senator MELCHER. Well, I do not know. We are trying to understand this chart.

As I said, when I look at the Department of Agriculture figures, I look at all the assumptions they make. What kinds of things are they assuming? The assumptions made by the Department are sometimes relative to facts, and sometimes are irrelevant to facts.

Dr. PENN. I understand, Senator, but the farm income accounts conducted by the Department of Agriculture are part of the national income accounts. Those concepts, and those data collection procedures have been examined by all sorts of people, and they are commonly accepted as being a professional way to do this.

Now we are arguing with averages. We can argue about my interpretation of these numbers, but I think the basic statistics in themselves are as good as we can get, and they are certainly not altered for political purposes from year to year.

Senator MELCHER. I am not saying for political purposes.

Dr. PENN. Or whatever.

Senator MELCHER. I think in some things there is some relevance to meritorious discussion of their tables. I happen to think this one is irrelevant, but since you are going to base the rest of your findings on it in these other tables——

Dr. PENN. The rest are not based on this. This is the income picture, and the others are the balance sheet statistics.

Senator MELCHER. Was any comparison done by any sampling of tax returns?

Dr. PENN. No.

Senator MELCHER. How about bank statements, where they list assets compared to liabilities, and what your income was on that?

Dr. PENN. No.

Senator PRYOR. A question on this chart [chart 8]. The equity, in achieving the equity percentage, is that the price of land? Is that the land value as of today, 1 year ago, or 2 years ago?

Dr. PENN. January 1, 1984. This would reflect land values in 1983.

Senator **Pryor**. The land values would then relate to the equity part of the chart, is that correct?

Dr. **Penn**. Yes.

Senator **Melcher**. Is this USDA?

Dr. **Penn**. Yes.

Senator **Pryor**. Thank you.

Dr. **Penn**. I will speed this up. We will skip table 3, since it contains the same information as on chart 8.

Going quickly to table 4, I would draw your attention to the three columns on the right, which show the rate of return to equity investment from current income, capital gains and the total. This relates to something that Senator Heflin asked earlier.

TABLE 3. FARM BALANCE SHEET BY VALUE OF SALES CLASS, JANUARY 1, 1984

Sales Class	Percent of				Per Farm		
	All Farms	Total Assets	Total Liability	Debt-to-Asset Ratio	Assets	Liabilities	Proprietors' Equity
				percent	- - dollars - -		
Less than $5,000	35.0	9.9	5.3	11.1	123,337	13,743	109,594
$5,000 - $9,999	13.7	5.6	3.3	12.4	176,486	21,952	154,535
$10,000 - $19,999	11.8	6.8	4.7	14.4	252,110	36,242	215,868
$20,000 - $39,999	11.4	10.3	7.6	15.3	391,006	59,788	331,217
$40,000 - $99,999	16.1	24.3	22.4	19.1	657,875	125,976	531,899
$100,000 - $199,999	7.5	19.3	20.1	21.8	1,121,393	244,084	877,309
$200,000 - $499,999	3.5	13.8	18.3	27.5	1,721,670	474,212	1,247,458
$500,000 and over	1.0	10.0	18.3	38.1	4,331,889	1,652,376	2,679,513
Total or All-Farm Average	100.0	100.0	100.0	20.8	435,120	90,591	344,529
$40,000 and over	28.1	67.4	79.1	24.4	1,045,156	255,353	789,803

Source: Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983, ECIFS 3-3, Economic Research Service, USDA, September 1984.

TABLE 4. RETURNS TO INVESTMENT EQUITY IN FARM PRODUCTION ASSETS

Period	Equity in Assets	Residual Income to Equity 1/	Real Capital Gains	Rate of Return to Equity Investment From		
				Current Income	Capital Gains	Total
	- - bil of 1967 dol 2/ - -			- - percent - -		
1940-44	89.7	6.46	5.68	7.2	6.3	13.5
1945-49	128.4	8.42	0.80	6.6	0.6	7.2
1950-54	144.0	6.48	0.43	4.5	0.3	4.8
1955-59	155.2	4.10	6.61	2.6	4.3	6.9
1960-64	173.3	5.38	5.42	3.1	3.1	6.2
1965-69	190.9	7.19	5.60	3.8	2.9	6.7
1970-74	206.1	11.77	13.54	5.7	6.6	12.3
1975-79	265.5	8.66	23.52	3.3	8.8	12.1
1980-83	281.8	3.74	-14.68	1.3	-5.2	-3.9
1979	300.9	10.14	10.83	3.4	3.6	7.0
1980	306.2	3.98	-1.83	1.3	-0.6	0.7
1981	299.5	6.24	-27.64	2.1	-9.2	-7.1
1982	272.5	3.43	-21.21	1.3	-7.8	-6.5
1983	247.6	1.34	-7.67	0.5	-3.1	-2.6
Mean 1940-83				4.3	3.3	7.6
Coefficient of Variation				0.55	1.60	0.85

1/ Residual income to equity equals total farm income returns plus net rent to landlords less returns imputed to operators' labor and management.
2/ Deflated by CPI.

Source: Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983, ECIFS 3-3, Economic Research Service, USDA, September 1984.

You can see that in most of the historicial period we have had a positive return from current income and capital gains, but beginning in 1980, and then in 1981, 1982, and 1983, we have had declining returns to capital gains. Those reflect the declines in land values, the most sustained, and the most serious decline in land values since the Depression. That has produced, in the right-hand column, the negative return to equity investment for all of agriculture of 7 percent in 1981, almost 7 percent in 1982, and 3 percent in 1983. So I think that is an indication of what is happening in the balance sheet situation.

The CHAIRMAN. What impact did inflation have, inflation going up and coming down have?

Dr. PENN. It has been taken out of those numbers. Those have been adjusted for inflation.

The next table, table 5, and chart 9 relate to the importance of exports. I think this is something that everybody now knows, that since the early 1970's we have become very, very dependent on export sales, and the decline that has occurred in the last 2 years. The 1985 forecasts now place the export value at $35.5 billion, which shows we lost a substantial share of our markets overseas since 1981.

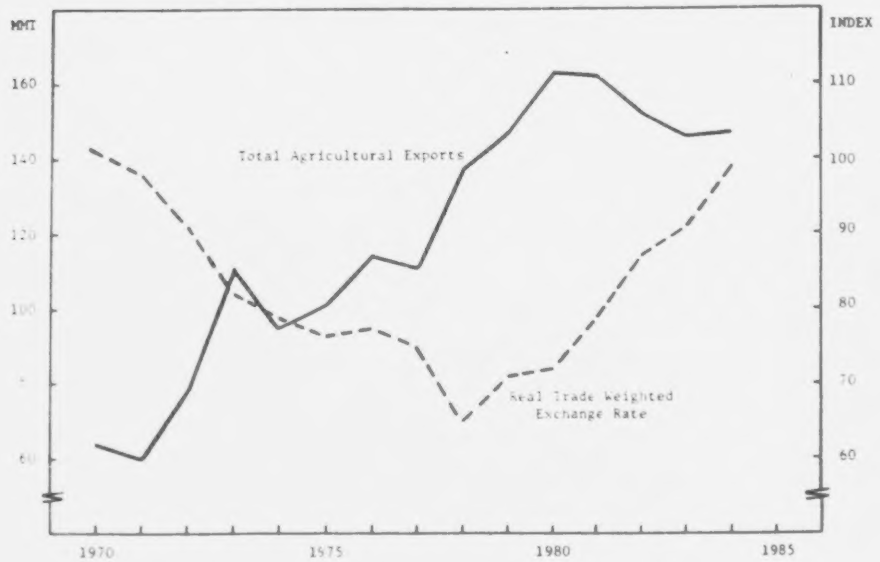
TABLE 5. U.S. AGRICULTURAL TRADE, VOLUME, AND VALUE

Calendar Year	Export Volume	Export Value	Import Value	Trade Balance
	million metric tons		- - million dollars - -	
1970	64.3	7.3	5.8	1.5
1971	60.3	7.7	5.8	1.9
1972	77.7	9.4	6.5	2.9
1973	111.2	17.7	8.4	9.3
1974	95.0	21.9	10.2	11.7
1975	101.0	21.9	9.3	12.6
1976	113.8	23.0	11.0	12.0
1977	110.7	23.6	13.4	10.2
1978	136.9	29.4	14.8	14.6
1979	147.3	34.7	16.7	18.0
1980	162.9	41.2	17.4	23.9
1981	162.4	43.3	16.8	26.6
1982	151.6	36.6	15.4	21.2
1983	145.6	36.1	16.6	19.5
1984	146.9	37.9	19.3	18.6

Source: U.S. Foreign Agricultural Trade Statistics Report, Calendar Year 1983, USDA.

Commodity	1981-82 Average Proportion Exported (percent)	Acre Equivalent (million acres)
Wheat	58.6	46.8
Corn	23.0	17.1
Cotton	46.6	5.0
Rice	44.9	1.6
Soybeans	43.4	29.5
Coarse Grains	22.1	24.1

CHART 9. U.S. AGRICULTURAL EXPORTS AND THE TRADE WEIGHTED VALUE OF THE DOLLAR, 1970-84



But I think the important part is at the bottom of the table, which shows for 1981 and 1982, the average proportion of the production of various commodities that were exported along with the acreage equivalent.

You can see about 100 million acres are involved, of the program commodities: wheat, corn, cotton, rice, soybeans, about 100 million acres involved in producing for export, about 1 of every 3 of the base acreage of the program crops.

Senator MELCHER. None of these figures have been adjusted for inflation?

Dr. PENN. No.

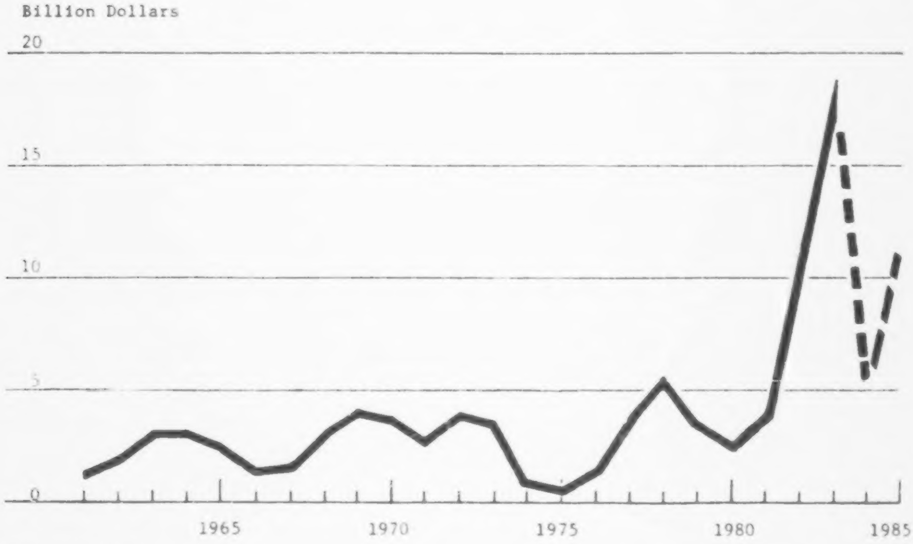
Senator MELCHER. Export value, 7.3, 1970, and purchasing power would be about 3 times?

Dr. PENN. A little less than 3 times. The CPI is about 2½ times what it was in 1967.

Chart 9, of course, is simply a plotting of the volume of our exports, and the real trade weighted exchange rate, taking into account the value of the dollar relative to the currency of those countries that are purchasing our imports. Of course, it too tells the story that most everybody knows, that as the exchange rate has continued to increase, the volume and value of our exports have declined.

The last two items, chart 10 and table 6 relate to net CCC outlays for farm support and related programs. Chart 10 also tells the story that everyone knows. The commodity programs cost an average of about $3 billion a year during the 1970's. Since 1980 they have averaged about $10 billion a year, over 3 times more.

CHART 10. NET CCC OUTLAYS FOR FARM SUPPORT AND RELATED PROGRAMS



Source: USDA.

Table 6. Direct Government Payments to Farmers By Value of Sales Class, 1983

Farm Size	Percent of all Farms	Percent of Total Payments	Average Payment Per Farm	Income From: All Sources	Payments As % of Income From All Sources
	(%)	(%)	($)	($)	(%)
Less than $2,500	21.4	1.4	257	21,294	1.2
$2,500 to 4,999	13.6	1.9	547	19,509	2.8
$5,000 to 9,999	13.7	4.0	1,146	19,891	5.8
$10,000 to 19,999	11.8	4.2	1,437	18,324	7.8
$20,000 to 39,999	11.4	10.6	3,626	16,493	22.0
$40,000 to 99,999	16.1	33.4	8,143	21,907	37.2
$100,000 to 199,999	7.5	22.6	11,837	38,474	30.8
$200,000 to 499,999	3.5	15.0	16,798	76,844	21.9
$500,000 and over	1.0	6.9	26,805	596,187	4.5
Total	100.0	100.0	3,922	29,048	13.5

Note: Total payments in 1983 were $9.294 billion.

Source: Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983, ERS, USDA, September 1984.

Senator, I think this very last table relates to your interest in PIK. These data are for 1983. They are the direct Government payments that were made to farmers in that year. They totaled $9.3 billion, and you can see where they went across the various farm sizes. You can see that those farms that had, for instance, sales of less than $2,500 got an average payment of $257. Farms that had gross sales of $500,000 and over got an average of $26,800 per farm. These include the PIK payments.

But I think the important item here is the right-most column, which shows the payments as a percent of income from all sources. If you look, for example, at the farms with $40,000 to $100,000 gross sales, you will see that 37 percent of their income in 1983 was from the payments.

Now, because 1983 was so atypical, because of payments over $9 billion, as opposed to the more usual $3 billion, these numbers are inflated. But even in the other years I have examined, the pattern is the same. The distribution across the various farm sizes change very, very little.

Well, Mr. Chairman, that concludes my discourse on the charts, and I am sorry if we created any confusion. I think we can clarify it, if we have more time.

The Chairman. Please stay seated, Dr. Penn. I am sure some members are going to come back to you with more statistical questions.

Dr. Paarlberg.

STATEMENT OF DR. DON PAARLBERG, PROFESSOR EMERITUS, PURDUE UNIVERSITY, WEST LAFAYETTE, IN

Dr. Paarlberg. Mr. Chairman, Senator Zorinsky, Senator Melcher, and Senator Pryor, ladies and gentlemen, I am very happy to be here.

I noticed I am sitting in Senator Lugar's seat. He is from Indiana. I am from Indiana. I am honored to be able to be here and to sit in this chair.

Our subject is farm structure, and in my statement I have addressed myself to a number of things that J.B. Penn has already spoken of, so I shall avoid duplicating that subject matter to the degree I can.

I am dealing more in terms of trends in structure, than I am in the structure itself, and I would like to tick off some of the major changes that have occurred in the structure of agriculture.

By structures, I mean the manner in which land, labor, and capital and management are put together to produce crops and livestock.

We have had a virtual agricultural revolution. Since 1930, that is, a little over 50 years, tractor-horsepower have increased 11 times. The farm output per man-hour of labor of agriculture has risen to 14 times what it formerly was. Acreage of land cultivated per farm worker has increased fivefold.

From 1930 to 1974, 33 million people have left agriculture. The tonnage of fertilizer used has increased 15 times. Crop production per acre, that is, yields, has more than doubled.

Since 1950, agricultural assets have increased 2¼ times in real dollars, that is, and to raise the necessary capital farm debt has increased in real terms about 5 times.

We are concerned with efficiency, which is output per unit of input. That has increased about 2¼ times in the last 50 years. Land holding has been much more concentrated.

In the north central States in 1978, three-tenths of 1 percent of the owners held 23½ percent of the land.

Now, these changes have affected both farmers and nonfarmers. Before these changes got underway, per capital income of farm people averaged only 37 percent as large as those of nonfarmers. In 1982 they had risen to 78 percent.

If you put this on a per family income basis, they were, in recent years, practically at the same level as incomes of nonfarm people.

Consumers have also gained from these changes; 50 years ago it took about 34 percent of personal consumption expenditures to buy food, and now that is down to 19 percent.

I will pass over some of the following material from my statement, because Dr. Penn has already discussed these things.[1]

Some things, though, I do wish to bring up, additional things.

Vertical integration has occurred. By vertical integration, I mean that more than one of the stages of production have been put under single management or ownership. Formerly the supplying of inputs, that is, fertilizer, fuel, et cetera, were in certain hands, farm production in other hands, marketing in other hands, processing in other hands, retailing in other hands. Now there has been vertical integration, and in recent years about one-third of agriculture has been, in this sense, vertically integrated, either by ownership or by contract. It formerly was so that we marketed the products competitively in central markets. That is on the retreat.

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[1] See p. 187 for the prepared statement of Dr. Paarlberg.

Incorporation, you hear much about incorporation of agriculture. We have family farm corporations. These are organized by the family, primarily to facilitate the transfer of the property from one generation to another. There are also some tax advantages.

Family farm corporations constitute about 1⅓ percent of all the farms. They control about 8 percent of the land in farms, and they produce about 9 percent of the farm product sales.

Now, there are some publicly held corporations that have come into agriculture. These are chiefly for specialty products, fruits and vegetables in California, poultry production in various parts of the country. Though these publicly held corporations are frequently cited as a threat to the traditional farm, they accounted, in 1974, and that was the most recent data available, they accounted for only six-hundredths of 1 percent of the farms, six-tenths of 1 percent of the land in farms, and about 3 percent of the farm product sales.

Farms are now more vulnerable than they used to be. It used to be that a farmer provided himself much of the labor, much of the fuel, much of the seed, and the other input items. Now he buys these items, and these are things that Senator Melcher was speaking of, so the margin between his costs and his gross, that has been squeezed, and as that is squeezed he becomes more vulnerable.

In a good year his income can be doubled. In a bad year it can be wiped out altogether.

The CHAIRMAN. Dr. Paarlberg, just for the purpose of emphasis, you passed over part-time farming statistics. I think you ought to give those, so everybody will understand what we are talking about.

Dr. PAARLBERG. It is particularly important in your part of the country, Senator.

The CHAIRMAN. Yes, sir.

Dr. PAARLBERG. In 1982, almost two-thirds of the income of people classified as farmers by the Census came from nonfarm sources.

Now, in your area, where there are off-farm employment opportunities, that is very important. In Montana, Senator Melcher, there are not equivalent off-farm employment opportunities, and there it is much less important.

Nationwide, in recent years, it has amounted to about two-thirds of the income of all agriculture.

The CHAIRMAN. But it is nearly two-thirds nationwide, on the average.

Dr. PAARLBERG. Nationwide, right.

Senator MELCHER. On how much production? How much production does that represent?

Dr. PAARLBERG. You mean how much production do these part time farmers produce?

Senator MELCHER. Yes.

Dr. PAARLBERG. Well, it is very low. I cannot give you the number, but as a percentage of the total, it is one digit, not two.

Senator MELCHER. It is insignificant?

Dr. PAARLBERG. It is very small.

Senator MELCHER. It is fair to say it is insignificant.

Dr. PAARLBERG. What it says is these people are not served by the Commodity Program, because they do not produce for the Commodity Program. We call them farmers, because that is how the Census defines them, but farming is not really their livelihood. They are rural residents, with some supplementary farm income.

Now, there are sharp arguments about the causes of these trends. Clearly, in my view, the dominant cause is technology, which calls for increased size of operations, more capital, more sophisticated management. But institutional forces have had their effect. Tax policies and public credit programs have made for larger farms.

Research and education programs have been offered to the farmers cafeteria style, and they have been picked up more readily by the larger operators, and have speeded up rates of change.

There is disagreement as to the effect of the commodity programs on the size of farms. Most operators of big farms contend that the programs have no effect on farm size, but in the next breath they will say putting a low cap on Government payments per farm would result in a break up of large farms.

I myself am more persuaded by the second of these arguments than I am by the first. I think a fair summary of the issue is that whatever may have been the effect of the Commodity Programs, it was overwhelmed by the effect of other forces.

Now, trying to look at that, to anticipate what may be ahead, I have described these trends in the structure of agriculture, and I have attributed them mostly to advances in technology.

What do we see ahead for technology? If we can visualize that, we can picture what will be the trends in the structure.

Every indication that we have indicates that the revolution in agriculture has not run its course; that the rate of technology will, if anything, continue and perhaps increase. The Office of Technology Assessment has a study that I think they are going to lay before you gentlemen in just a few days which I think is an excellent study; and it undertakes to anticipate which sources of technology will be important in the years ahead and what the rates of increase would be in production per acre and per animal, and they anticipate the technology revolution pretty much staying on course. If that is true and unless there is interference of some kind, the trends I have described would largely continue.

Now, are these trends good or bad? There is a difference of view about this. Some people think they are good because they increase efficiency, make available abundant supplies of food at relatively low prices. Some people think they are bad because they place stress on individuals. We have moved some 30 million people off of farms in the last 50 years, and every one of these decisions was fraught with personal difficulty and immense adjustment problems; and the social stress associated with this revolution is in the minds of many people very great.

Some people say that with public policy we should try to slow down these trends. Other people say the public policy should keep hands off and allow the forces of competition to express themselves. Perhaps most people think that it should be the purpose of public policy to slow down these trends.

I address in the latter part of this statement some 10 or more different proposals that have been put forth by various people that allegedly might slow down the trends in farm structure that are under way. I have grouped these in two categories.

One are those that would be unlikely to reverse structural changes under way but have much public attractiveness and are in various forms before the body politic. One is to continue or increase farm price supports. Despite the purposes that appear to the preamble to the various agricultural statements, it is true that most of the benefits of commodity programs go to the larger farmers whose incomes are already above the farm and nonfarm average, and in my judgment serves to speed up the reduction in the number of farms and the increase in the average size. Price supports have not saved the family farms. Family farms are now by number about one-third what they were when these programs began.

Prohibit farming corporations; you hear this often.

As has been shown statistically, corporations are not a major rival to privately held farms and outlawing them would have little effect on trends previously discussed.

Prohibit vertical integration and contract farming, some people suggest this. But to outlaw vertical integration and contract farming would be to deprive farmers of an assured home for their products with known terms of sale. It is hard to see how this would affect farm structure for the better.

Prohibit the purchase of land by nonfarmers; we hear that proposal. With farms increasing in size and the capital needs growing, investment per farm grows very large and so large as to be out of reach for all but those in specially-favored family circumstances.

Ownership of land by nonfarmers and the intelligent leasing of land to farm operators is a way of helping young men get started. Ruling out this possibility is to eliminate a remedy, not an ailment.

Cheap credit. Much of agriculture's present problem is the result of easy credit and excessive borrowing during the late 1970's and early 1980's. It is hard to see how openhanded credit would solve a problem that it in part created, nor would it slow the trends discussed earlier, particularly since however subsidized credit is intended, most of it winds up in the hands of the big farmers. That is indicated by Dr. Penn's figures.

Government purchase of land and lease thereof to farmers, individual farmers. This is proposed and some States have initiated small-scale programs of this sort. It has attractiveness as a way of helping young farmers to get started. It would give Government an opportunity to influence structure but not without complication. Government would interpret to whom farming opportunities would be granted and from whom they should be withheld. It would reverse the land policies of most of American history.

Now, I address another group of proposals. These are proposals that have real teeth in them, that would change structural trends, that would slow them down. If there is sincere intent to slow down or reverse the trends in agriculture, there are ways of doing it.

No. 1, a progressive tax on farmland would reverse or check the trend toward fewer and larger farms. It would relate to accumulated wealth in land much as the progressive income tax relates to the annual flow of wealth.

No. 2, tough inheritance laws. Instead of making it easier to pass large farms intact from one generation to another, as was the purpose and effect of recent legislation, such taxes could be increased with the objective of breaking up large farms. This would require sale of part of the land to pay the tax and would give a young man a chance to buy land and start farming.

No. 3, change other tax laws. Various institutional arrangements favor the large farmers. These are cash basis accounting, preferential taxation of prospective capital gains, deductibility of interest on borrowed funds, investment tax credits, and several methods of computing accelerated depreciation. All of these give subtle preference to big farmers, who use enormous amounts of capital. These tax provisions could be withdrawn.

No. 4, targeting Government programs. Instead of relating farm program benefits to the number of bushels produced, which favors the larger farmers, they could be targeted to those farmers in the middle range of size, described earlier in this testimony.

No. 5, and the last one, reorder research and extension. The trends previously documents are mostly the result of technology. New technology results from research and education. Research and education, about half of which are funded by the public, have speeded the substitution of capital for labor and contributed to the observed trends. If research and education were shifted away from high technology toward intermediate or low technology, the trends could be slowed. This would mean curtailing basic research, helping develop farming systems for small and part-time farmers and working with cooperatives that pool buying and selling power for farms of small or moderate size.

Now, the gist, Mr. Chairman, of this testimony is as follows:

No. 1, structural changes are so profound as to constitute a veritable revolution.

No. 2, they have deep-seated causes, the dominant one being technology which, if anything, seems to be accelerating.

No. 3, the structural changes are on balance a cause of public concern.

No. 4, there are effective ways of slowing or reversing these trends, but they are so unattractive that they are unlikely to be adopted.

No. 5, and finally, we are likely, therefore, to continue our ambivalent course, continuing to promote those changes by our public policies but nevertheless lamenting them for their social effects, real and alleged.

That concludes my statement, Mr. Chairman.

The CHAIRMAN. A very fine statement, Dr. Paarlberg.

Some of your proposals under the category of unlikely to slow or reverse structural changes now under way, at least two of them I do not believe could be done constitutionally, but that does not inhibit people from recommending it to me. I hear it all the time. You have got to do so and so. But it would hit the courts and out it goes.

Under the proposal that would change structural trends, a progressive tax on farm real estate, tough inheritance laws, when the Congress passes that sort of thing I want 24 hours' notice so I can get out of town. I can imagine the onslaught.

Senator Zorinsky.

Senator **Zorinsky**. Thank you, Mr. Chairman.

Dr. Paarlberg, I have been a strong advocate of the market-oriented farm policy and under such policy you stated that the Government's role would be to improve the functioning of the free enterprise system, and I quote you, "And place a floor over the pit of disaster."

Last week, Secretary Block informed this committee under the administration's farm bill that farm income would be reduced for the next 2 years.

My question to you is, Considering the serious financial problems that many producers are experiencing today, does a farm bill that will result in 2 years of lower farm prices place a floor over the pit of disaster or will we be coming back and, according to your statement, which says 33 million have left the farms, be able to say that finally all of them have left the farm?

Dr. **Paarlberg**. The administration has a program for alleviating the problem of those farmers who have excessive debt and who have a prospect of making it with the help of the administration, with some write-down of their loans, with some stretch out of their payments. It was the President's feeling that this was a program that placed a floor over the pit of disaster.

I know that many in the Congress differ in their view of that matter, but that was the President's position and it is a position that I support, Senator.

I do not think that under the present and prospective circumstances there is going to be any new large wave of people leaving the farm. I think there are all kinds of ways that these heavily-indebted farmers are going to work out of their situation.

One way is already happening in my State, which is Indiana. Farmers who have very heavy debt and cannot meet their interest and principal payments are selling the farm to the lender, to the banks, for example. The bank then rents the land back to the farmer and thereby reduces the amount of money that he must bring up each year to carry the operation. This is sometimes coupled with an arrangement whereby after a period of time the farmer has the first option to repurchase the farm, if it seems well and wise for him to do so.

So I do not think that there is going to be a great exodus from agriculture. We heard from Dr. Penn that the difficulty is concentrated very largely with those particular farms which expanded excessively with high indebtedness during the late 1970's and early 1980's. It is not representative of all agriculture. It has been aggravated by particular problems of drought or disasters in some areas and sometimes poor management. So it is a particular situation but not a general situation.

Senator **Zorinsky**. Have you been in Nebraska in the last year, the last 2 years?

Dr. **Paarlberg**. I have not been in Nebraska in the last year. I was in Nebraska a couple years ago.

Senator **Zorinsky**. Where? In Omaha?

Dr. **Paarlberg**. Yes.

Senator **Zorinsky**. Speaking to a group?

Dr. PAARLBERG. Yes. I have met with Nebraska people. I have been at farm debt meetings in Kansas City.

Senator ZORINSKY. How about Arapahoe, Verdigre, Grant?

Dr. PAARLBERG. I have not been there.

Senator ZORINSKY. That is where the farms are. They are not in Omaha. They are not in Kansas City.

Dr. PAARLBERG. They are in Indiana. I have been there

Senator ZORINSKY. The point I am making is everything works out fine at this table and with numbers and with projections and everything. Do you get out once in a while to townhall meetings?

Dr. PAARLBERG. Oh, yes. I go out on extension meetings. I have met with farmers. I am retired, but I am still reasonably active and I meet with farm people.

Senator ZORINSKY. You do not have administrators in Indiana coming up to you and telling you that the farmers are not paying their property tax and that is eroding the mill levy for the school district and there are no schools closing up of nonpayment, there are no banks closing up because of nonpayment, the farmers can be saved by borrowing them more money instead of making sure they get a profit?

Dr. PAARLBERG. We have had seminars at Purdue University, which I have attended and assisted with, of farm lenders and of farm borrowers and we have had a series of extension meetings out in the State where we go out and talk with the farmers about their debt problems. I consider myself to be reasonably well informed on the farm debt situation in Indiana. Admittedly, I have not been in Nebraska and I know by all the accounts statistically and verbally that the situation is much more serious in Nebraska, in western Iowa, in Minnesota, in northern Missouri than it is in Indiana.

Senator ZORINSKY. Dr. Penn, do you go out to talk to groups like that?

Dr. PENN. I do.

Senator ZORINSKY. Have you been up in the Green Belt out there and actually participated with farmers that have problems?

Dr. PENN. Quite a lot of farmers, yes.

Senator ZORINSKY. And your views are still that the majority of them are OK and they are going to make it and there are no problems really of grave concern to be worried about?

Dr. PENN. I do not know that I would put it in exactly the same words that you did, but I generally share Dr. Paarlberg's assessment that the fundamental health of the agricultural economy is sound, although there are significant problems in specific areas of the country.

Senator ZORINSKY. I need you to come out and talk on my behalf out in Nebraska because I cannot sell that.

The CHAIRMAN. If this committee will indulge me, in fairness to Dr. Farrell whom we want to hear from, let us proceed with his testimony. Then we will pick up the questioning with Senator Melcher and Senator Zorinsky.

Dr. Farrell.

STATEMENT OF DR. KENNETH R. FARRELL, DIRECTOR, NATIONAL CENTER FOR FOOD AND AGRICULTURE POLICY, RESOURCES FOR THE FUTURE

Dr. **Farrell**. Thank you, Mr. Chairman.

I apologize for not having a formally prepared statement for committee members. As I anticipated, my esteemed colleagues who spoke before me have said virtually all there is to be said on this topic. I can best serve the committee by presenting just a few summary comments and then answering any questions you may have.

It is quite clear from available data and research that the absolute magnitude of benefits flowing from Government commodity price programs for the past 50 years has been very unevenly distributed among farms categorized by various size classes as Dr. Penn has just indicated. It is clear from those data that the larger firms, however you classify them, receive or have received a disproportionately large share of the direct payments relative to their numbers in agriculture. That scarcely should be a surprising or revealing conclusion since the benefits of the commodity price programs are structured by and large to be directly proportional to the volume of production by participating farmers.

Second, it is clear that long-term benefits derived from commodity programs have not been large over the past 50 years at least in terms of real aggregate farm income.

Also it seems that we would be hard pressed to conclude that farm commodity programs have been successful in terms of one of their other objectives, namely, that of stabilizing prices and incomes to the farm sector. In fact, there is some indication that prices and incomes have become more unstable, notwithstanding the massive investments in commodity programs.

Those benefits which have accrued, have been directly and rather quickly capitalized into land values. Thus landowners tend to be the long-term beneficiaries of such programs as distinct from farm operators. They are not at all synonomous in large parts of agriculture. As Don Paarlberg pointed out, land ownership in this country is relatively concentrated. He cited the data for the North Central States, but I would suggest that the numbers are at least as concentrated for the country as a whole. The result is that the distribution of benefits accruing in the form of the land asset has been very highly concentrated among the relatively few who own large amounts of cropland.

Numerous factors other than farm commodity programs have influenced the development of today's trifurcated farm structure. Research and technology, particularly that research and technology which required large amounts of fixed capital investments to employ it, have created economies of size in agricultural production and thus have tended to favor growth in the size of the farm firm, much of it occurring through consolidation of existing farm units.

The development of highly industrialized systems for production and distribution of commercial farm production inputs and associated pecuniary economies, discounts for volume purchases for example, also has tended to favor larger-sized operators.

Likewise, mass merchandising, high volume food processing, manufacturing, and distribution systems that are geared to receiving a large volume of standardized products, tend to favor the larger producer.

Further, the size of the farm operation may to some extent determine the ease of access and the terms of access to critical markets upon which modern agriculture is dependent, particularly capital markets and I would say the information markets, using that term very broadly.

In addition, the structure of Federal, State, and local tax policies probably has had significant structural impact across agriculture, although probably quite uneven by region.

Finally, the cafeteria-style of our extension services, designed to help those who help themselves, coupled with the scale-enhancing effect of many technologies may inadvertently favor the larger operators who are in a ready position to employ the technology and knowledge dispensed by these agencies.

My point is merely to indicate that there are many economic, institutional, and technological forces in the agricultural environment apart from commodity price programs of the Government which favor bigness and contribute to the growing concentration of agricultural production.

I do not think we really know whether had we had no commodity programs in agriculture for the past 30 years that we would now have a more or less concentrated structure than we have today. However, we can say that if it were national policy to retain a less concentrated structure in American agriculture, say, to retain relatively more of the middle-sized farms, some explicit set of structure-related policies would be needed with emphasis not just on changing the distribution of commodity program benefits but also to influence the other factors which I have mentioned that shape structure—research, extension, capital markets, and tax policies.

Mr. Chairman, that concludes my statement. I will be glad to respond to any questions.

The **Chairman**. Thank you very much.

Now we are operating, the committee willing, on a 5-minute round. I took about 1 minute. Ed took his 5.

Senator Melcher, you are next and then Senator Heflin and then we will start another round.

Senator **Melcher**. I cannot get much done in 5 minutes, but, Don, how long were you in the Department of Agriculture?

Dr. **Paarlberg**. For 13 years.

Senator **Melcher**. Did you think, just to clear up a point, during that 13-year period there were a lot of times that those charts and data from the Department took a lot of understanding?

Dr. **Paarlberg**. They did take a lot of understanding. Sometimes the issues they dealt with were quite involved and sometimes some simplification is needful in order to make the essential facts coherent. So, it does take a lot of understanding. I do think though that there has not been a deliberate obscuring of the central facts. I agree with J.B. Penn on that point. He and I at different times had similar responsibility in the Department of Agriculture. Each of us in turn had responsibility for the Economic Research Service, the analysis of factual matters in the agricultural sector, the organizing of the facts and the presenting of them in charts and statements.

Senator **Melcher**. When I first came here and served in the House, I think it was fair to say that there was not any of this testimony that ever reached the committee that did not have the imprimatur mark of Don Paarlberg. I do not think they allowed anything out of the Department in those days that you had not checked over and saw that it was consistent with what you thought the Secretary's position was.

Dr. **Paarlberg**. Well, J.B. Penn was in an agency position in the Department at the time when I had top responsibility, and I will ask whether to his knowledge I ever struck out any pertinent facts that came forward out of the agencies because——

Senator **Melcher**. I know the answer to that. He would have agreed with you, Doctor.

Dr. **Paarlberg**. He has no responsibility——

Senator **Melcher**. I am not accusing you of putting up facts that were not warranted. I am just saying that you cleared what was presented because you were at the level where you could.

Dr. **Paarlberg**. And because I had for my own information. I had to know what the position was that was going forward to you gentlemen because I would get a phone call 5 minutes after on what is the significance of this or how was this figured; and unless I had knowledge of what was coming forward to you gentlemen, entirely apart from any censorship, unless I was informed I was avoiding my responsibilities and my opportunities as a Department official.

Senator **Melcher**. Let me say from my standpoint it was not all bad. I learned a lot from you, Doctor.

Dr. **Paarlberg**. Thank you.

Senator **Melcher**. I want to only go to one of your points, I think, because I think three of them we knock out, the proposals that would be likely to slow or reverse structural change underway and you have fixed them. I do not think there is any question but we can forget about 2, 3, and 4 because they are probably improbabilities at best, impinging on individual rights at worst and, nevertheless, they would not be part of what we are considering here in this committee. So I want to talk about No. 1; 5 and 6, both can be debated as being meritorious handled properly, but always leading to pitfalls.

No. 1, do you think that we ought to drop the rates as low as what the President's bill has indicated?

Dr. **Paarlberg**. I think the President's bill is a tough bill. I think it points the necessary direction. I think, however—and this is my private view; nobody asked me about this—I think it is too abrupt. I think the transition from our present programs to a more market-oriented program should occur more gradually than is proposed in the President's bill. I think it is asking a great deal of the competitive market, that it should solve the ongoing problems of supply, demand and price. I think it is too much to ask of it suddenly to solve satisfactorily not only those current problems but to correct the misallocations that have come from 50 years of Government intervention in the production and marketing of these products. That is just too much to ask of it.

I think that the bill is a negotiating position. That, again, is my own view and I may get some flack from my good friends in the

Department for this statement, but that is my view. You asked me and I give you a frank answer.

Senator MELCHER. I thank you for that answer.

I want to pick up on questioning on what we do beyond that in my next round because my 5 minutes are up, I am sure.

The CHAIRMAN. Senator Heflin.

Senator HEFLIN. I am sorry I had to miss part of it. I was out talking with some of the people from my land-grant university, and they are vitally interested in research.

Dr. Paarlberg, I would just like for you to give us your views on what the direction of research in agriculture should be at this stage for the future.

Dr. PAARLBERG. That is a very searching question. I think—and this is my own personal view—that our agricultural research provides excessive inputs into areas that could be serviced by the private sector, that it should be balanced up and should address itself more than it does to the problems of the middle-sized farms and to those farmers who really are in difficulty.

Now, I know that that is not the view of the agricultural establishment or of the directors of the experimental stations, but you asked my view and I tell you that frankly.

Senator HEFLIN. Dr. Farrell.

Dr. FARRELL. In my view the agricultural research establishment should concentrate its resources on the development of basic scientific, long-term research. A very recent report from the Board on Agriculture reinforces that judgment.

Although we are currently experiencing agricultural surpluses and farm income is low, it will be in the long-run interest of agriculture and consumers to continue development of basic science related to agriculture. I agree with Don Paarlberg that part of that concentration on the more basic kinds of research could be secured through reduction in public research spending on very applied kinds of adaptive research which the private sector or the Extension Services to some extent could readily take up.

Senator HEFLIN. You had a comment?

Dr. PENN. No.

Senator HEFLIN. That is my time, I assume.

The CHAIRMAN. Thank you, Senator.

I want to ask you to do an impossible thing. Put yourself in the chairs and the shoes of the members of this committee. We are charged with the responsibility of trying to come up with a farm bill that makes sense. If you were Senator Paarlberg instead of a private citizen retired, Dr. Paarlberg, Dr. Penn, Dr. Farrell, I would like to know, say, three mandatory questions we must address and I am going to lead you a little bit because I want to know whether Jack Block is right or wrong in what he said to this committee the other day.

His three policy options, as he stated them, as I recall, were that, (1) we can continue present price support levels; (2) we can move toward a market-oriented farm policy; or, (3) we can have a higher price support program for the various commodities.

Now, what I would like for you to do as briefly as may be possible, and perhaps you would want after this hearing is over to submit additional comments in writing, which would be made a part of the record because I think this is what we are driving at, and we would entertain those responses.

Now, first of all, I ask each of you, is the Secretary of Agriculture roughly on target with those three options?

Dr. Penn.

Dr. PENN. I think that those are the three broad options that we face: To continue what we have, to try to move toward greater market orientation or to turn inward looking again.

The CHAIRMAN. Do you agree?

Dr. PAARLBERG. I agree with that and I think that of the options that the Secretary has named, the administration has named, that of moving toward market orientation is a proper choice. I think the other two have been proven bankrupt. I think that the present program has been enormously costly, has lost markets for us, has given its benefits unduly to those who were in the least difficulty and it should be changed. I think higher price supports, we tried that before. We had to accompany it with very stern mandatory controls and 20 years ago the people rejected that and the Congress has been unwilling to reinstate it. So I think that the second option is the right one.

The only question is with what speed and with what tactics do you move toward market orientation.

The CHAIRMAN. I might add there is a second farm bill that has been introduced.

Dr. PAARLBERG. I know that, Senator.

The CHAIRMAN. Dr. Farrell.

Dr. FARRELL. Well, yes, I agree those are broadly speaking the three principal options. On the so-called market-oriented policies, that does not really help me very much because the term means different things to different people. I would want to know how far and just how you would accomplish that. I would suggest that the key question is how you achieve greater market orientation or greater flexibility and responsiveness of Government programs, not whether we move in that direction.

I would certainly add to the third option, higher price supports. As Don has suggested you cannot talk realistically of higher price supports without stronger or mandatory kinds of supply management programs to go along with it.

The CHAIRMAN. And the consequential impact on our exports.

Let me go at it from another direction. Tell me the impact, if you will, and let me give you the first one.

What if we continue the present price support levels; what is going to be the impact there?

Dr. PENN. I think we are going to continue to see a sluggish farm economy. There is not much on the horizon that suggests we are going to greatly expand exports and improve the farm economy, and we are going to continue to have very costly programs. The programs as they are now structured, if continued and even if you freeze target prices and loan rates are going to be very expensive over the next 4 to 5 years.

The CHAIRMAN. Dr. Paarlberg.

Dr. PAARLBERG. I think if we continue the present program the stimulation to production and the laxity of the controls will result in a very high production of farm products. The pricing system will keep us from getting those products into the international markets, and we shall have to make deep production cuts, whether we wish to or not, in order to keep the costs of the program within reasonable bounds; and as we make deep production cuts, the Canadians, the Australians and the Argentinians will move in to take the markets from which we have withdrawn.

The **Chairman**. Do you have reservations about the market orientation, the free market and so forth, Dr. Farrell? Tell me the impact if we increase the price support.

Dr. **Farrell**. Well, I think the impact will be fairly obvious with current kinds of programs. One, we run the danger of exposing the U.S. Treasury to larger deficits. Two, equally important perhaps is the danger we run of becoming less competitive in world markets. I think those are two of the very obvious effects.

In the short run, it might well help to improve farm income and the cash flow of farmers, but as a long-term policy it has major problems.

The **Chairman**. I understand the three of you are saying that the only choice really is to move toward market orientation, but it has to be more definitive as to how and when and the speed and that sort of thing. Is that correct?

Dr. **Penn**. Yes, sir.

Dr. **Paarlberg**. Yes.

Dr. **Farrell**. Yes, I would agree with that.

The **Chairman**. This is one of the rare times we have unanimity on that side of that table.

Senator Zorinsky.

Senator **Zorinsky**. Let me ask this question: What type of a prognosis would you see for a two-tier pricing system which targeted the ultimate takeover for the profit structure for farming by the consumer rather than the taxpayer domestically and then isolating that price structure from an international marketplace where, of course, the Canadians have nationalized their railroads which gives them some advantage to equalizing transportation from Thunder Bay regardless of where the farm is, with their own allotments programs, because they market through a wheat board. People are doing a lot and governments are doing a lot for their farmers that we are not even though we scream bloody murder over here how we are doing such wonderful things for farmers.

I feel that the surpluses that we have been trying to reduce, as you pointed out, the void is being taken up and filled by our so-called friendly competitors; and if we establish a low price, they come in and utilize whatever price we establish as the price they can go under with their own subsidies.

As a matter of fact, I was at an European Economic Community meeting not too long ago. We could not even agree on the definition of the word "subsidy," let alone whether to eliminate subsidies.

I would just like your comments concerning a two-tier isolation where Government gets out of the subsidization business domestically in a gradual manner with a farm program that is targeted with mandatory controls that is counter productive to increased production other than for a marketplace, that gradually over a period of years pulls out and self-destructs itself as the consumer begins to take over the obligations of paying a little bit more for food.

Somebody mentioned we spent 19 percent of our disposable income for food. I heard from the Secretary of Agriculture in comments the other day that it was 14 percent, but it would not hurt to spend 15½ or 16 percent. If you transposed the American public into other countries, they would find out they spend 60 to 80 percent. So we still have a good bargain. But I think a cheap food mentality in this country has worked adversely to the taxpayers' own interests, by the taxpayers having to prop up the difference in order to keep the farmers in business. I think that is what we are all trying to get away from by going to a market-oriented condition. But do any of you on that side of the table think there is a free marketplace out there in the international arena, because having been a businessman for 30 years I come from the school that gives kickbacks, rebates, discounts, dog eat dog out there; and you know, if you are telling the guy to go into a free open marketplace and the treasury of a country is screwing up that free open marketplace for you, I do not think we can classify that as a free open market unless we do the same thing. But you cannot do it unless you isolate two tiers, domestically so we can keep farmers in business, because the lower we get our farmers to produce for over here, so we can compete in the international marketplace, the less farmers we are going to have and the less in business to produce the commodity for that free marketplace is my concern, and I would like to know if you have any comments on that type of a philosophy.

Dr. PENN. Dr. Paarlberg.

Dr. PAARLBERG. I certainly do not favor that proposal, Senator. First of all, we are the biggest agricultural country exporter, the biggest country in the international food business in the world. We have our own special concerns, our own special gifts and attributes.

Now, it is, I think, appropriate for us to devise our agricultural policies with reference to our own situation rather than to react and emulate what somebody else does, particularly if the somebody else is in different circumstances and of less significance than we. I think there has got to be a better argument to obstruction of the trade flow of farm markets than simply that somebody else does it.

When I was 10 years old, I learned a very important point. I thought it was appropriate for me to eat as much pie as my bigger and older brother, which I tried to do, and found out this gave me a stomach ache. Since that time, I have tried to devise my eating habits with reference to my own needs, not to emulate what somebody else does. I think that same principle applies with regard to agricultural policies. That is one point.

Now, the other point, a two-tier system, devising a system whereby the retail price of food is higher so as to divert some benefits to the farm area, the facts are that the per capita incomes of farm people who receive the majority of the benefits of the farm program are substantially higher than the per capita incomes on the average of those people who buy food. If you were to rig the system so as to transfer income from the consumers, who already are on the average at a disadvantage, to the farmers, the ones who received the benefits, who already have an advantage, that would aggravate rather than alleviate the differential between these two sectors of the economy. Apart from what is equitable, I do not think that is good economics.

Senator **Zorinsky**. Thank you. I put you down for leaning against. [Laughter.]

But it is unique—and it is a good answer. I would not quarrel with it except that in your opening remarks, you stated that we are the biggest agricultural producer in the world. If I had closed me eyes, I would have thought the president of General Motors was talking only a few years ago. We must learn from mistakes. We seem to think just because we are big in something today, there is a guarantee that we will continue to be big in something tomorrow.

But, as you pointed out in your testimony, there are a lot of changes taking place. We have a lot of competitors out there. Whoever would have thought that India would be a net exporter of corn? Ten years ago, no one thought that in 1985 we would be concerned about India or even the People's Republic of China as competitors. Those of us who have met a payroll understand there are no guarantees out there. If you do not keep up with what your competition is doing, you will end up in the poorhouse some day, wondering what happened to you as a businessman.

I do not say we have to guarantee profit for business people and compliment bad business management, but we must operate in the real world, with real dollars. If some competitor is taking us to the cleaners with credit terms for their exports, I think we have go to go out there and do likewise. The purchaser, the customer does not care what flag we fly over our country. They want to know our prices, our terms.

We just lost a good military sale to France from Peru. They wanted American helicopters and American jets, and I asked, "Why did that happen?" I was told the French worked out a longer term, lower interest agreement, and even though Peru would like to have our planes, we could not match the terms offered by France. The bottom line is the dollar. If you don't get out there in the marketplace and secure customers, you aren't going to be in business very long.

I think this is one of our shortcomings. We think there is a utopia out there, that there is a beautiful international marketplace out there, that we know how to do it best, and at the same time we are sure as hell taking a lot of lessons from somebody. Otherwise, we would not have a $123 billion trade deficit.

Thank you, Mr. Chairman

The **Chairman**. Thank you, Senator Zorinsky.

I think we do not want to emulate the French in terms of the value of the franc, and that is part and parcel of what is happening to them. They are shooting us in the foot as well as themselves, but they are going to get themselves first.

Senator Melcher.

Senator **Melcher**. Don, to pick up where we were before in the same line of questioning, what was the first farm bill you had input into as an official of the Department?

Dr. **Paarlberg**. Well, as a farm boy back in 1933——

Senator **Melcher**. I do not mean that.

Dr. PAARLBERG [continuing]. I had input into the AAA, the Agriculture Act of 1954 was the first one in which I had input as a Department official.

Senator MELCHER. Then picking up more recently, what was the first one after 1954?

Dr. PAARLBERG. After 1954, it was one in 1956 which got vetoed. There was one in 1958, I think, that if I am remembering right, involved the soil bank that got signed, and then intermediate ones of greater or lesser importance. Then I was away during the drought years when the Democrats were in the White House. [Laughter.]

Senator MELCHER. They are still in Congress. They may not be in the White House. Some of us are here.

Dr. PAARLBERG. I came back in 1969, and I had input in the Agriculture Acts of 1970 and 1973.

Senator MELCHER. 1970 and 1973?

Dr. PAARLBERG. Right.

Senator MELCHER. You were with the soil bank?

Dr. PAARLBERG. Right.

Senator MELCHER. Then 1970 and 1973, both of those. Let me say this.

Do you remember Ben Stong?

Dr. PAARLBERG. No, I am afraid I do not.

Senator MELCHER. Ben was my administrative assistant, and during the years that you were there, he cut quite a swath as you did, but in different circles. You were more attuned to the Department and Purdue, and he was more attuned to the farm organizations.

Dr. PAARLBERG. How do you spell his name?

Senator MELCHER. S-t-o-n-g.

Dr. PAARLBERG. I do not recall him. I recall the name.

Senator MELCHER. He was my administrative assistant. Ben always thought, along with all these numerous farm organizations, that price supports and production controls could be balanced out and they work. I always had to vote on them and I never really had much faith in them working. I think that is about your conclusion.

Dr. PAARLBERG. Yes, sir.

Senator MELCHER. But I had to vote because they were in the final bills that you got, at least in 1970 and 1973. You did not recommend veto. You recommended accepting them.

Dr. PAARLBERG. That is right.

Senator MELCHER. So you in the executive branch were not satisfied with them and I in the legislative branch was not satisfied with them. I think there is a lot more in common between us than most people would recognize.

Dr. PAARLBERG. Yes.

Senator MELCHER. I appreciated your answer on whether this administration's proposal was a good proposal at this time on price supports. You said probably too fast and it would be too much disruption. I want to get the other side.

Let us take it for granted we have got abundance of production of American agricultural products. That is a given. We can agree on that. We have got abundance. No matter what we do, we always have abundance.

What about section 416? I mentioned that at the outset. What do you think of that?

Dr. PAARLBERG. Well, I think that a donation of American food products is a good thing if done with care and with regard to the interest of the recipient as well as with regard to the interest of the donor. I think the relationship between the amount of food donated and the general well-being of the donor and recipient is in the form of a curve. I think a certain amount of it is good. I think that if you exceed that amount, several bad things happen. You drive down the price of food in the recipient country and inhibit agricultural production and make the country continuously dependent on donations. You inhibit the self-reliance of the recipient and deprive him of some of his self-respect

So there comes an optimum point for these programs. I think, for example, that we are putting too much food through Public Law 480 and others into Egypt and driving down the price of farm products there so they feed bread to chickens. So we inhibit their own agricultural development. I do not think that is good. I think the amount that you should do depends on the time and the place and the recipient and your availability, and whether it serves your legitimate diplomatic purposes and whether it serves humanitarian concerns.

There is no quick easy answer to this.

Senator MELCHER. Since you are aware of section 416, what would be your response to the Assistant Secretary or to the Secretary or to any group that refused to use wheat in section 416?

Dr. PAARLBERG. Well, I would want to know what the total situation was. I would want to know how much wheat is programmed under Public Law 480. I would want to know to what countries and under what circumstances the section 416 donations were being proposed. I would want to know those things.

Now being retired and 700 miles removed from this place, I am not in good circumstances to give precise answers to the nature of the proposed interest in Public Law 480.

Senator MELCHER. I like your answers. They are relevant to what should be considered.

Just as an aside, let me tell you that wheat has not moved since it was added to section 416, not 1 bushel, and the reason it has not moved is because the Department has said we do not want any wheat applications. Officially now they have removed that and said we want wheat applications as of December. They still have not moved any yet. I think it is pretty stupid not to use wheat. Those are the pertinent points.

You mentioned donations, however section 416, as modified, now includes barter. Do you think that is legitimate?

Dr. PAARLBERG. Well, Senator, 3,000 years ago, the Phoenicians invented money, and that was an improvement over the barter method of exchange that had been previously used. I think that was a great forward stride, and I do not think that a return to the pre-3,000 year ago method is a very good method. Money is a wonderful institution and it does not depend on what barter depends on, which is the simultaneous existence of demand for the two commodities involved. Money is a means of relating people to two sides of the equation, abstracting from the particular need that we might have for diamonds, and the need somebody else might have for wheat.

Senator **Melcher**. All right. I have to profess a lack of understanding on how barter works, but I know some companies do quite well on barter.

Dr. **Paarlberg**. Some companies do very well. They make great big fees on it, I know that. I was there when we were administering this program, and some of the things that happened I think were best kept in the inner drawer. [Laughter.]

Senator **Melcher**. You mentioned benefits to the country of donations and the relationship to section 416. I want to ask a question. I guess the obvious one is are there not benefits to the donor nation, to the United States, in the building up of trade or trade potential?

Dr. **Paarlberg**. That is right.

Senator **Melcher**. We can agree on that and there is no question that it works that way.

We have now wheat on section 416. Would you suggest that perhaps we should consider adding, for instance, corn, sorghum, rice, soybeans to section 416 as eligible commodities?

Dr. **Paarlberg**. Well, we can and do move those things under Public Law 480, and we have a title 2 in Public Law 480 that permits us to work with the voluntary agencies. And it seems to me that section 416 is in measure a parallel of these things. So I think it is an alternative device for doing things that can be helpful, both to recipient and donor, if properly administered.

Senator **Melcher**. More flexibility?

Dr. **Paarlberg**. Yes.

The **Chairman**. Gentlemen, thank you very much. It has been very interesting and enlightening. We appreciate the time you spent in preparation and waiting and visiting with us. Thank you very much and we will be in touch.

We stand in recess.

[Whereupon, at 12:30 p.m., the committee recessed, to reconvene at 10 a.m., Thursday, March 14, 1985, in room 328-A, Russell Senate Office Building.]

FRAMEWORK AND ANALYSIS FOR AGRICULTURAL POLICY IN 1985

Loan Rates, Target Prices, Supply Management, and Production Controls

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THURSDAY, MARCH 14, 1985

U.S. SENATE,
COMMITTEE ON AGRICULTURE, NUTRITION, AND FORESTRY,
Washington, DC.

The committee met at 10 a.m., in room SR 328-A, Russell Senate Office Building, Hon. Jesse Helms (chairman) presiding.

Present: Senators Helms, Zorinsky, Melcher, Pryor, Boren, Dixon, and Heflin.

The CHAIRMAN. The committee will come to order.

We have a quorum as long as we have Al and John.

Senator DIXON. Mr. Chairman, I would like to make a very brief statement because I have to go to the Armed Services Committee.

The CHAIRMAN. We will be delighted to hear from you, and since you have a time situation, we will let you go first.

STATEMENT OF HON. ALAN J. DIXON, A U.S. SENATOR FROM ILLINOIS

Senator DIXON. Mr. Chairman, I want to commend you for holding these hearings on the vital issues of the loan rates, target prices, supply management, and production controls in agriculture policy, and I would like to especially note the presence of Harold Guither, a professor of agricultural policy at my alma mater, the University of Illinois. My office has benefitted greatly from his assistance, and I am pleased he is able to testify before the Agriculture Committee today. I know, Mr. Chairman, that my colleagues will benefit greatly from his counsel, and I thank the Chair.

The CHAIRMAN. You were brief.

Senator DIXON. Yes, sir. I promised you I would be.

STATEMENT OF HON. JESSE HELMS, A U.S. SENATOR FROM NORTH CAROLINA

The CHAIRMAN. Do not run off. I am going to put most of my statement in the record, but let me say this is the second in a series of what we call thematic hearings. We are getting so bureaucratic around here that we are using esoteric words. These are thematic hearings regarding agricultural policy.

It is the first time I know of that any congressional committee has undertaken these kind of hearings to study and assess what impact farm programs and policies have had on the American agricultural industry. The Tuesday hearing, Alan, was fascinating, and on that occasion we examined the structure of agriculture. I personally found it very helpful to me. Generally speaking, Senators in attendance participated in a bipartisan fashion and came away, I am confident, with a better understanding of the structure of the agricultural industry and the impact that farm programs have on the industry as a whole.

Our topic today is long range. We are also going to discuss loan rates, target prices, supply management, and production controls. Since the Agricultural Adjustment Act of 1933, commodity loans and production controls have been the fundamental farm policy instruments of this Government. Direct income transfers in the form of target prices with deficiency payments are a relatively new policy tool, even though the concept was proposed by President Truman's Secretary of Agriculture, Charles Brannan, in 1949.

The point is this. The effectiveness of these policy tools is being called into serious question. We have to ask ourselves a lot of questions in the coming weeks: Why are they not working? Can they work? Will they work?

Most analysts, and I think Members of the Senate, agree they are not working because agriculture is now part of a global business economy and is subject to forces generally beyond the control of the Secretary of Agriculture, the House of Representatives or the Senate, even the President of the United States.

I have just a delightful statement of some length, but I am not going to read it. But without objection, it will be included in the record.[1]

Senator Melcher.

Senator MELCHER. Mr. Chairman, I have nothing at this point.

The CHAIRMAN. Thank you, sir.

We have a five-member panel this morning, and we will ask them to take seats there. Since we have a scarcity of Republicans in town, it will make it look like we have some Republicans here.

Dr. Ronald D. Knutson, who is professor of the agricultural and food policy center, Texas A&M University, good morning, sir.

Dr. Raymond Daniel, vice president and managing director of industries services, Chase Econometrics, B-a-l-a C-y-n-w-y-d.

How is that pronounced?

Dr. DANIEL. Bala Kenwood.

The Chairman. You are probably the only man in the room who knows how to pronounce it.

Dr. Luther Tweeten, who is a regents professor, department of agricultural economics, Oklahoma State University at Stillwater.

Dr. Bruce Gardner, professor of economics at the University of Maryland, and we all know where that is.

Dr. Harold Guither, extension economist, public policy and professor of agricultural policy, University of Illinois.

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[1] See p. 190 for the prepared statement of Senator Helms.

We welcome all of you gentlemen, and we appreciate the time that you have devoted not only to preparing your discussions here today but coming here. I know it is a sacrifice but you are going to be a big help to us. I want you to know we genuinely and sincerely appreciate it.

We will try to make this as brief as possible for you.

The ground rules are that, of course, any prepared statement that you have we will include in the official record which will be printed and circulated to all the Senators and other interested parties. You may deliver your entire prepared statement or you may summarize it. I think the best course to follow would be for all five of you gentlemen to be heard from and then we will have questions.

You may proceed in the order seated.

STATEMENT OF DR. RONALD D. KNUTSON, PROFESSOR, AGRICULTURAL AND FOOD POLICY CENTER, TEXAS A&M UNIVERSITY, COLLEGE STATION, TX

Dr. Knutson. My name is Dr. Ron Knutson. I am a professor in agricultural food policy at Texas A&M University's Agricultural and Food Policy Center.[1]

The purpose of my testimony is to assess the need for and potential for the effective use of supply management policies in agriculture. In agriculture, supply management generally engenders the popular extreme views of either the free market or mandatory production control advocates. I do not represent either extreme. I find it curious that in the remainder of American industry firms meet to produce the needs of markets, not to generate surpluses. If surpluses accumulate, they cut back on production. If firms overadjust, they lose markets. No questions are raised about the desirability of such adjustments.

In agriculture suggestions that production might be tailored to market needs are strongly criticized. The standards are somehow different, and I raise the question as to whether that makes any sense. Agriculture is an inherently unstable industry, and it is instability, more than anything else, that justifies farm programs.

The purpose of farm programs is to reduce that instability. Judicious increment use of supply management policies consistent with the level of surplus stock can help to reduce the degree of instability that is inherent in agriculture. The sources of agriculture's instability are many and are beyond the control of farmers.

In a free market agriculture, the firms that survive will be those that are able to employ the skills required to cope with a high level of risk and uncertainty, and these will not be average family farmers.

My own view is that this is the worst possible time to try to move to a free market agricultural economy. American agriculture is entering a biotechnological era, an era where the rate of increase in agricultural output is likely to accelerate. Globally, agricultural output is rapidly increasing in a number of major food producing and/or exporting countries. Over the next 10 years with a full production strategy combined with technological infusion, it is easy to visualize grain exporting countries increasing output in excess of 50 percent. It is very difficult to see how the market can absorb that magnitude of increase. The point is that surplus conditions will, in all probability, be considerably more common in the years ahead than deficit conditions.

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[1] See p. 192 for the prepared statement of Dr. Knutson.

Agriculture is very likely headed back into a period of chronic surplus conditions such as existed in the 1950's. Without the power to adjust supply to market needs, we should expect turmoil in agriculture over the next two decades.

The burden of that adjustment will be on middle-sized family farms. When surpluses develop, there are two basic alternatives for adjustment. One is to rely on the marketplace to lower farm prices and to force excess capacity out of agriculture. Those farmers forced out of business are likely to be ones with the highest costs of production and probably the ones with the greatest debt load. The effects of forcing farmers out of business will extend beyond the farm gates to the financial and employment base of rural communities.

The second alternative is to remove excess capacity from the marketplace through a supply management program. Such a program should be designed only to bring supplies back in line with market needs, domestic and foreign. It should not short the market in an effort to support farm income. To do this, a combination of voluntary and short- and long-term land retirement programs are suggested.

In analyzing the effectiveness of supply management policies, it is important to distinguish between programs that mandate participation and voluntary programs where producers have a choice of whether to participate or not. The most effective supply management programs involve mandatory regulation of the quantity of the product marketed, that is, marketing quotas. However, marketing quotas are contrary to an economic and political system that favors voluntary participation.

Quota systems have many other problems. They increase costs, foster inefficiency, and destroy markets. When quotas substantially increase producer prices, the benefits are capitalized into the value of the quota itself. Generally quotas become an additional element in the cost of production which, of course, is eventually passed on to consumers.

The adverse effects of quotas are most pervasive when production controls are pursued on a vigorous, continuous, long-term strategy basis. There is no reason to anticipate the same degree of adversity when supply management strategies are pursued as a voluntary policy to reduce instability if surpluses accumulate.

The history of success on voluntary production controls is not particularly good. A rule of thumb has developed which states that if 15 percent of the land devoted to a particular crop is taken out of production, the quantity produced will decline by only 3 percent, that is, there is 80 percent slippage. To be effective, supply management programs must be in a position to both stabilize production in the short run and deal with the potential for longrun excess capacity in agriculture.

One way of accomplishing these dual objectives is through a combination of year-to-year voluntary diversion programs, a longer rangeland retirement program, and in addition, sodbuster provisions that discourage bringing new land into production. It is very important that voluntary programs be made more effective than those of the past.

Timing is crucial to the effectiveness of voluntary supply management programs. Without proper timing surplus commodity stocks continue to accumulate, and costly PIK-type programs result. One way to avoid timing errors is to provide a supply management trigger in the farm bill. The trigger would initiate a diversion program when the ratio of commodity stocks to use rose above a specified level.

It is easily documented that once the stock-use ratio rises above 40 percent, in the case of wheat, prices tend to settle at the support level. There is then a high probability that the Government will acquire large stocks of wheat. To avoid such a takeover, a 40-percent stock-use ratio trigger might be used to initiate a 15- or 20-percent diversion.

As a result, one suggestion is to move to a trigger system for implementing diversion policies. I might add, if it is found that a trigger mechanism does not sufficiently remove excess supplies from the marketplace, then you move to a long-term land retirement strategy, and take land out of production consistent with its excess capacity.

The costs of diversion programs, are a major concern, in part because of the double tax concept on consumers. That is, consumers pay twice, once to take land out of production, and then they pay again at the supermarket. One method of avoiding high taxpayer costs is to put them on a self-financing basis.

Self-financing has been reasonably effective when utilized in the case of milk. With tighter administrative procedures it could have been even more effective. A 5-cent checkoff could be taken on each bushel of wheat, and that the proceeds be used to reduce program costs. This concept could be applied across all agricultural commodities, not only used to finance short-term diversion programs, but also used to finance long-term and retirement programs as well.

It is also important that commodity programs be used to achieve conservation goals. If that is going to be accomplished, the most erosive land needs to be taken out of production. Erosion control diversion could be used in the short run on voluntary diversion programs, but it is considerably more effective in long run supply management programs.

Studies indicate that 53 percent of the soil erosion occurs on 11 percent of the farmland. If diversion policies were limited so that 11 percent of the most erosive farmland were taken out of production, the conservation objective could be achieved while also working toward the achievement of the supply management objective.

In addition, if this were done on an assessment basis, the effectiveness of farm programs could be improved from the standpoint of supply management, conservation policies, and cost.

Let me conclude by saying that in terms of surplus production market prices signal the need to move resources out of production.

This can be accomplished either by the survival of the fittest system, or by an effective supply management strategy.

The market does not care, as long as resources are removed. Society might quite rationally decide to act more humanely.

As a general rule, economists have expressed substantial aversion to supply management programs. This aversion results, in part, from a lack of sensitivity to the range of production control possibilities. For example, the alternatives are viewed as being the extremes of either a free market or mandatory controls. I contend that there is a middle ground.

Firms throughout our economic system manage supplies without destroying their markets. Agriculture can do so also, without the economic and social costs involved in the free market adjustments.

If the tools are provided, we can manage supplies in agriculture without destroying markets, and without high costs to consumers.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Dr. Knutson.

Dr. Daniel.

Dr. DANIEL. I am going to give some illustrations.

The CHAIRMAN. Very well.

STATEMENT OF DR. RAYMOND DANIEL, VICE PRESIDENT AND MANAGING DIRECTOR, INDUSTRIES SERVICES, CHASE ECONOMETRICS, BALA CYNWOOD, PA

Dr. DANIEL. I think one of the biggest challenges in dealing with a group of economists, and I mean that in all sincerity, is the identification of the assumptions used in arriving at specific conclusions.[1]

For example, if you give any group of economists, one set of assumptions and one set of goals that you want to achieve, and you provide one set of constraints that they must use to achieve those goals, then most economists will arrive at the same conclusions.

But if you have multiple goals, multiple constraints, and make multiple assumptions, you arrive with multiple answers.

This is a very critical concept when dealing with the issue of whether to expand demand or reduce supply, because all economists want to achieve a balanced agriculture. No one wants continued surpluses which disrupt the market.

So the key is very simple. At Chase Econometrics I deal with 75 different companies and I would say most of them currently have excess capacity and high inventories. Therefore, they have been facing the same problem as U.S. farmers. Can we expand sales through more marketing activities or lower prices or must we reduce production. The objective is to increase revenues and improve profits. If increased sales require more expenditures than the returns from the new sales then it is unprofitable. Also, if lower prices mean lower total revenue then it does no good to reduce prices, especially when the new prices are below costs.

Therefore, we must be sure that we understand the objectives of current and new farm programs. If we have different or conflicting objectives then we may not be able to develop a good farm program.

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[1] See p. 199 for the prepared statement of Dr. Daniel.

The No. 1 goal of farm programs on the surface appears to be to provide an adequate supply of food and fiber for the American consumer and our neighbors.

We have certainly achieved that goal. In fact, we have more than achieved it. It seems many critics have used this against the farmer, and say they have done a poor job. A few years ago, farmers were highly respected for their productivity. They were considered the most efficient farmers in the world. Now they are bums.

In my opinion, there are about 150 countries that would be happy to trade their farmers for ours. No country in the world spends only 15 percent of their income for food. No country in the world has ever had the selection of foods we have in the supermarket at such reasonable prices.

Is that success or failure? Have our farm programs succeeded or failed? I think we should give the chairman of our Senate Agriculture Committee, and the Senate Agriculture Committee, a reward for such outstanding accomplishments. The best variety of food ever produced, and the biggest supplies at the lowest cost.

But there are other objectives, which need to be accomplished such as stability in the farm sector, especially farm income stability. This is a very basic question. Is one of the objectives of farm programs improved farm income? If not, then we can develop an entirely new farm program, but if the objective is to improve farm income, then we must be sure all proposals improve farm income, by bringing production and inventories in line with demand at prices which increase farm income since the farm sector is facing bankruptcy. Another objective would be to promote and to enhance our farm exports. We should also improve the use of our land and water resources for the next generation.

Recently, the overriding objective seems to be to reduce the Government deficit. If the objective of farm programs is to reduce Government cost irregardless of the consequences, then someone else will have to pay. It will either be the producer or the consumer, both domestic and foreign.

The farmer will pay for adjustments through lower prices and bankruptcy. The consumer and foreign purchases through high prices.

Agriculture changed dramatically during the 1970's. During the 1950's and 1960's agriculture was characterized by very stable prices and excess surpluses and 65 million acres in a soil bank program. In 1972, we made a major adjustment away from excess supplies to the free market, and there was the difference.

Look at the price explosion in 1972, up $3 a bushel, and since then we have had a free market. The free market was supposed to solve all the problems of agriculture. Recently everyone was to blame the perceived failures of agriculture on farm loan and target prices. However, free market prices were much higher during most of the decade. They were responsible for expanding production thus creating surpluses.

However, we now begin the 1980's with the same problem. Government controls and stability in the 1960's and "free market," with wide swings in the 1970's.

Senator HEFLIN. Do you have copies of those charts?

Dr. DANIEL. We will be happy to provide them to you.

Senator HEFLIN. The distance between the low end of the totem pole on seniority and that screen is too far. [Laughter.]

Dr. DANIEL. Let me continue.

We should realize from this overview that the largest growth in exports in history during the 1970's did not prevent the largest financial collapse in agriculture since the 1930's.

What is therefore the solution to the problem—total Government control or "free market." If anyone in 1975 had said that corn exports would be 2.4 billion bushels and wheat 1.8 billion bushels by 1985, they would have been considered crazy. Prices would have been forecasted to be double where they are today. What happened?

There have been considerable changes in our export markets. In the 1950's and 1960's, our agricultural products were sold in Europe, Japan, and other developed nations. In the seventies our markets shifted to centrally planned economies of Russia, China, and Eastern Europe. In the last 5 years our markets have shifted to Latin America, Southeast Asia and the developing nations. The shift was not by accident. We were driven out of the markets in Europe because of trade embargoes and tariffs. Now Europe is the No. 3 exporter of wheat in the world because of their subsidized agriculture.

If we try to expand exports in Europe, they won't let us. We have also lost Russia; once we dominated the Russian market. When the Russian market was 22 to 25 million metric tons, we had 70 percent of the market share. In 1979, we decided that we did not like their policies, therefore, we embargoed grain shipments. Now they purchase 40 to 45 million metric tons and we only have 30 to 40 percent market share. So we have almost lost that market.

Was that the American farmer's fault? Who lost these markets?

We also had a major grain market in China and recently we decided to restrict their textile exports to the United States. They subsequently cut back our grain sales. We sold to the Communist countries until 1979 when we embargoed their purchases. That is not free trade, I assure you

There is no free trade in Europe, no free trade in the centrally planned countries, and that now leaves us only with the developing nations of the world as our marketplace. And these countries do not currently have the ability to pay and they are also erecting barriers to trade.

The developed world population is growing, and that has been a very strong growth market for the United States. However, in the last 3 or 4 years, they have a problem. Their debt is so high they cannot afford to buy. So now our last marketplace has no money to pay for our products.

We also have another major problem, and that is we have decided to tax the American farmer in the marketplace. In 1979, we decided to control the money supply and increase interest rates, have a big high deficit, and increase the value of the dollar to record levels.

In the first half of the decade, we felt bad about the cheap dollar. The dollar in real terms was declining as were our prices in the world marketplace. Actually, we were getting a subsidy because of the low value of the dollar. However, in 1979, that turned around, and right now every wheat farmer has to pay an additional dollar a bushel because of the high dollar.

Senator **Heflin**. I understand you basically from your evaluation of export markets, unless the foreign countries' policies changed toward the United States, there is no——

Dr. **Daniel**. There is no free market.

Senator **Heflin**. There is no export market that we can gain?

Dr. **Daniel**. That is correct unless we want to give it away or at a very high cost or price.

Senator **Heflin**. What do you mean by price?

Dr. **Daniel**. If you want to get the market you may lose dollar sales just to get volume. If we lower the price, and if the elasticity is less than one then you lose revenues. Most economists are now coming to the conclusion that in the short and intermediate run, where the short and intermediate run is 1 to 4 years, that the elasticity is around −0.7, so if you lower the price by 1 percent, the volume increases only 0.7 percent. Volume does increase, but what happens to your total revenue? It goes down. So you have sold more quantity at less revenue.

So do you want to pay that price? The issue is how much margin or how much profit are you making and how far can you dig into your pocket to sustain that loss in revenue? If you have no profit, what do you do? Who is going to pick up the loss, for that is what is happening now. We are actually selling at a loss. That is what I am talking about. Can the U.S. farmer pay the price?

The corn farmer in Iowa pays 72 cents for every bushel he sells because of the high value of the dollar.

During the last 2 years, we lower loan rates and prices to improve exports. However, the high value of the dollar actually increased our wheat prices on world markets.

The increase in the value of the dollar also added $2 to the price of soybeans. And that is why we now are having trouble selling soybeans in the world markets.

Many economists say our prices are too high, that we have got to lower our prices to be competitive. In nominal dollars wheat prices have actually exceeded $4 per bushel for nearly half the decade, and we had the most profitable agriculture in the world. Now prices are close to $3 per bushel and exports are down. One of the reasons that prices went down is that exports went down. However, in real terms our prices are back to pre-1970 levels.

How low must we go? If we drop prices further, which farmers will go out of business? I am sure it won't be in Europe or Japan where farmers are guaranteed much higher prices by their government. The American farmer will be the one who is driven out.

The free market, that is, "subsidized" market will do it. Ninety-five percent of all grain is bought and/or sold by governments. I tried to find a country which had no tariff and no import quotas. I think I found Hong Kong and Tahiti and one other somewhere. That is our problem, there is no "free market."

I kind of feel like the kid who believed in Santa Claus and then had to face reality when dad became unemployed.

Can export expansion eliminate current surpluses and excess capacity in agriculture at profitable levels for U.S. farmers? Let's review recent changes in the demand for wheat. Other crops are very similar

Domestic demand has increased slowly during the past decade as the U.S. population has increased. However, exports have increased dramatically. In the 1960's, about 600 or 800 billion bushels were exported primarily through Public Law 480. In the 1970's, exports increased to 1.2 billion bushels when Russia entered the market. In the 1980's exports have increased to 1.5 to 1.8 billion; they have dropped recently due to the high dollar and trade restrictions. However, we continue to maintain decade-high surpluses of 1.2 to 1.4 billion and we have close to 20 million acres of wheat idled. These surpluses have dropped real wheat prices back to 1969 levels. We would have almost to double exports to eliminate this excess capacity.

The recent decline in exports of 300 million bushels and subsequent drop in the U.S. market share has been cited as evidence that U.S. farmers have become noncompetitive in world markets, expecially with respect to Argentina. This is then used as evidence for dropping U.S. price support programs.

However, the decline in grain exports is due more to the dollar raising the U.S. wheat price by a dollar a bushel and the fact that Government intervention caused the decline, then a drop in U.S. support programs will hurt U.S. farmers through lower revenues.

If we drop U.S. wheat prices $1 per bushel, we still cannot guarantee that we would increase volume enough to help revenue; thus U.S. farmers would certainly go bankrupt.

In fact, we have been lowering wheat prices since 1979 and it has not been effective in stopping the decline in exports. How low and for how long must we lower prices? Also, who will pay for the current glut in agriculture?

Many analysts say, let's let the free market determine prices. But, since it doesn't exist, our farmers will bear the brunt of collapsing prices and bankruptcy. Our farmers will have to compete against the treasuries of other countries. Europe is not going to eliminate their farm subsidy programs and import tariffs to accommodate U.S. farmers. Russia is not going to buy from us unless they have to, after what we did to them, and farmers in the rest of the world have potectionist policies and the high value of our dollar to protect them. Therefore, we will not be able to expand demand to eliminate the current excess capacity. Therefore, we must seek other alternatives. The U.S. Government suposedly got farmers into this problem and the Government should continue to pay. Therefore, the strategy would be to keep target prices at current levels and lower loan rates. This is indeed a feasible alternative. However, it could cost as much as $20 billion annually.

Another approach is to reduce loan rates and subsidies on exports thus letting the Treasury of the United States compete with foreign treasuries until tariffs and other trade barriers are eliminated. This is also a very expensive program. The Executive Office is determined to reduce Government spending. Therefore, both of these programs will be considered too expensive. We therefore must develop an alternative farm program which improves farm income and reduces Government cost.

My suggestion would be to reduce surpluses and capacity, thus improving prices and do it at no cost to the Government. In the export market our objective should be to increase dollar sales not volume. Farmers must be able to make money not continue to export at a loss. Since we have assumed that the U.S. Government is unwilling to increase deficits to support farmers in world markets, then the only way you are going to increase total revenue in agriculture is increase price and improve farm income.

Our statistical analysis indicates that, in the short and intermediate run, 1 to 4 years, that increases in prices will increase total revenue while lower prices lower total revenue.

Maybe after 5 years, lower prices might stimulate higher revenues but U.S. farmers financially cannot wait that long. How do you raise prices? Well, you could raise the loan rate and keep subsidizing Government purchases thus holding high Government inventories. Then you will have the same problem in 5 years, that is, overproduction and large surpluses.

We have not identified the real farm problem, surplus production in not only the United States but around the world. How did we get there? We have had improvements in yields, we have had improvements in technology, we have had a slowdown in world population growth, economic recessions, and a major expansion in North American production capacity.

Also the world's ability to pay has dropped dramatically.

Then how do we control supply? I agree with Dr. Ron Knutson that one of the options is, indeed, a set-aside program. We have got supply control programs in place now and Dr. Knutson mentioned some of the most key limitations of these programs.

The major shortfall of the current programs is that they are not effective and are too expensive. During the last 30 years we have had five set-aside or acreage reduction programs. However, since they are voluntary programs, the farmers went fence row to fence row within 2 years thus eliminating the effectiveness of the previous supply adjustment. More specifically everytime price has collapsed during the last 30 years the USDA, House and Senate agricultural committees have paid billions to stimulate large acreage reductions. These reductions did indeed work and improved both price and farm income. Once such improvements occurred, however, the farmer was no longer willing to reduce acreage the next 2 years. And since the programs were voluntary, he expanded acreage, prices collapsed, and we are right back where we started.

How many more years are we going to pay for the up and down, up and down game of voluntary short-term programs?

Now, Dr. Knutson has offered one option and that is that we set a production target and adjust and maintain production in line with demand. This would improve and stabilize prices and incomes. It would also reduce Government costs.

However, Dr. Knutson's alternative costs money. How much would depend on participation in the program. However, there is another alternative to supply management. A lot of people accuse me of being a nonfree marketman and that everything should be capitalistic and voluntary, I am not, but I am against misleading the farmers about the existence of free trade.

We have got to face the fact that voluntary programs don't work since they are short term and are too expensive. Other Government paid acreage programs are also too expensive and cause problems such as the public's misunderstanding of paying farmers not to produce. Under these conditions of large Government deficits and low farm prices I feel we have no choice but to develop mandatory supply control programs. Thank you.

The CHAIRMAN. I suspect you are going to get questions when we finish with the panel.

We will hear now from Dr. Tweeten of the department of agricultural economics, Oklahoma State University.

You know this man, David?

Senator BOREN. I certainly do. We are proud of Dr. Tweeten. He has been at OSU since 1962 and is one of our leading agricultural economists in the Southwest. He has written four books. I have lost count of how many articles he has written, I believe over 300, but he is certainly an expert in this field and I am very pleased to have an opportunity to welcome him to the committee this morning.

The CHAIRMAN. Dr. Tweeten, you may proceed.

STATEMENT OF DR. LUTHER TWEETEN, REGENTS PROFESSOR, DEPARTMENT OF AGRICULTURAL ECONOMICS, OKLAHOMA STATE UNIVERSITY, STILLWATER, OK

Dr. TWEETEN. Mr. Chairman and Senator Boren, other members of the committee, I am very pleased to be here.

I want to enter my formal statement for the record. I will summarize my formal statement as briefly as I can.[1]

I wish to make six points and then I will look rather specifically at commodity program features.

My first point is that there is little point in having other than a market-centered agricultural policy for the long term. The major reason for this is that commodity supply control programs holding prices above market clearing levels do not contribute to net farm income over time, anyway. Partly, this is because higher support prices generate additional output. They also discourage consumption. This leads to surpluses which, other things being equal, tend to depress prices.

If the surpluses do not create enough problems, capitalization of benefits will. Commodity program benefits are capitalized into land values and also into rents, and that means that renters and new owners lose the benefits of commodity programs. Thus, commodity programs do not provide income benefits to farmers for extended periods.

Point No. 2, the farming economy today is extremely troubled by two major problems:

One of them is excess capacity.

The other is financial stress.

According to my calculations, with normal weather at today's prices and in the absence of Government programs, farmers would produce 5 percent more output than the market would absorb. If that excess capacity were released on the market, it would depress farm prices about 20 percent and receipts 15 percent.

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[1] See p. 209 for the prepared statement of Dr. Tweeten.

The second major problem faced by farmers today is financial stress. According to my calculations, one-fourth of all farmers and 50 percent of farm debt are experiencing severe financial stress. It is of note that both of these problems trace to Reaganomics. If Reaganomics were a drug, we would first have tried it out on Canadian rats. Many of them would have died and that would have been the end of the experiment. But this economic experiment is being tried on the American people and it has been a hard lesson for the American farmer.

To a great extent the excess capacity in agriculture traces to high exchange rates for the value of the dollar which reduce exports. The financial crisis in agriculture traces primarily to high real interest rates, and both high real interest rates and exchange rates in turn trace to huge Federal deficits. Here we are talking about full employment—structural—deficits.

There are two lessons from this. One, the transition quickly to a market-centered agriculture—which I believe the vast majority of agricultural economists favor—cannot take place overnight without turning a very difficult financial situation in agriculture into a debacle.

Two, it is important to recognize that a successful commodity program policy is not going to be adequate in itself. The real loan rate for wheat has declined 10 percent since 1980. That is a significant drop viewed from the standpoint of the farmer. Viewed from the standpoint of the foreign purchaser of our farm products, the real loan rate has increased since 1980 by 40 percent and the reason is because the value of the dollar has increased 50 percent. It is difficult for the farmer to export in that kind of market. The point is that a commodity program cannot in itself be successful in solving farmers' economic problems. A commodity program needs to be accompanied by responsible fiscal policy.

My third point is that voluntary supply control programs can be effective in the short run, but as now constituted they have lost their capacity to restrain output at reasonable costs to taxpayers for extended periods. The programs have actually encouraged additional output. Wheat is a good example. The wheat allotment base increased from 53 million acres in 1975 to 93 million acres today. If we had market-clearing prices, nowhere near 93 million acres of wheat would be planted. The programs have encouraged additional output.

No. 4, there are two basic approaches to simultaneously reduce production and Treasury cost of farm programs. One is mandatory controls. World markets are sensitive to price. Dr. Daniel properly mentioned that response to price does depends on the time period considered The markets tend to be elastic in the long run. As to what they are in the short run, it is difficult to say.

In 1967, and some of you have been around long enough to remember 1967, we signed an international grains arrangement with a number of countries and we set the Gulf port price of wheat at $1.73 a bushel. Other countries were to honor this commitment and sell no lower than this price. We sold little or no wheat for 6 months. We then dropped the international grains arrangement. That was a perfectly elastic demand for wheat even in the shortrun. So the shortrun demand elasticity depends very heavily on the nature of stocks and the nature of excess supply around the world.

We would forfeit the farm export market to our competitors and sacrifice a major source of foreign exchange earnings if we adopt mandatory controls and high support prices. Wheat utilization would be as low as one-third of the current size. If a foreign nation would force us into this position of giving up two-thirds of our wheat market, we would probably be willing to fight them. Yet there are those who would deliberately do this to ourselves. I find that incredible.

An alternative is to rely more heavily on lower market prices to reduce production and expand sales in a market-centered agriculture. This could be accompanied by targeting of commodity program benefits to those who most need help, which would be a way of keeping Treasury costs down.

Point No. 5, farm economic problems are especially concentrated among midsized family farms. The incidence of financial stress is lower on larger farms because they have on the average considerably higher rates of return on investment than midsized or small farms. The incidence of financial stress is lower on smaller farms because they have substantial off-farm income. This means that we are going to have to make a decision whether to do something with commodity programs to preserve the midsized and smaller farms which have been the backbone of American agriculture. To preserve midsized farms, it will be necessary to target benefits. Another advantage of targeting benefits is that this keeps Treasury costs down.

If we target benefits, several other conclusions follow. One is that it may be necessary to give up supply controls because the larger farmers produce more than half of the output. To control supply, you have to include those farmers who produce most of the output.

Second, to control supply, you must have market clearing loan rates because, if there is no way to get rid of surpluses, you cannot afford to accumulate them.

Point No. 6, the 1984 target prices for corn, cotton, and wheat, according to the Economic Research Service [USDA] estimates, were very near full resource costs of production on well-managed, adequate-sized farms. It would be unwise at this point to raise target prices further, in part because of the high Treasury costs that would entail.

Given the six points in this background, what kind of commodity program can best provide income protection for farmers who need it and hold down Treasury costs while allowing farmers, who want, to compete in world markets at competitive prices?

The following proposal is a compromise between the various objectives of farm policy and draws on some features of past programs as well as the administration's proposal.

First looking at loan rates, in my judgment the most notable feature of the administration's proposal is the use of past market prices to set loan rates. But a drop to 75 percent of the past 3 year moving average of market prices in 1986 is too drastic and too soon. I suggest a drop to no less than 85 percent of the past 3 year average price in 1986 and 1987; then to 80 percent in 1988 and 1989, and to 75 percent in 1990 and thereafter. Before 1990, however, it is very likely that lower real interest and exchange rates will bring a rebound in farm exports and farm prices, so the loan rates will play a diminishing role, perhaps even no role, in markets.

Current loan rates make the United States less than competitive in world markets, given the high value of the dollar. Increased loan flexibility would allow market prices to fall to levels that restrain production, while allowing farmers to sell abroad. But not every farmer can or wants to sell for the export market at such a price. Hence we come to the topic of target prices.

To give farmers income protection, I propose that target prices be maintained at current levels for at least 2 years. I add two conditions to hold down Treasury cost:

(a) Provide target prices and deficiency payments only on 70 percent of the allotment base. This is approximately the average of domestic utilization over all commodities. The base would be frozen for the 4 year life of the program, so that a farmer who planted more or less would not change his deficiency payment.

I noted earlier that one of the problems of the past is that farmers increased their base acres and their yield in order to become eligible for commodity program benefits—a very easy and tempting process.

(b) Payments would initially be no more than $50,000 per operator, the current level, but would be scaled down at a rate of $10,000 per year, eventually reaching $20,000, if the desire it to preserve the midsized and smaller family farms. I am not urging that should or should not be done. I am just saying if you want to preserve those farms, more benefits would have to be targeted to them.

If it is not deemed important to give a special benefit to the midsized and smaller farms, then payment should eventually be phased out in a market-centered agriculture. Hence on midsized and smaller family farms, farmers who wish to produce more would receive the world price. A farmer who judged this inadequate could scale back his production. He would receive that target price on the domestic portion which on well-managed farms is sufficient to cover all resource costs.

Next, we turn to supply control. In general, the price mechanism would control supply without diversion programs. I talked earlier about excess capacity in agriculture. That capacity exists at the will of Government. At some price markets will clear. Among major commodities wheat is the only case where stocks are currently at unrealistically high levels. That poses a special burden for farmers if we are to move them toward a market-centered agriculture. They deserve a fair chance to compete without those burdensome stocks hanging over the market.

Therefore, I suggest that a paid diversion program, even a payment-in-kind program, would be necessary for a year or two to reduce the stocks to about 1 billion bushels. Also, a paid diversion program might be necessary until loan rates fall to 75 percent of the average past market price. Then lower market prices would restrain output for other commodities.

It would be a major mistake to terminate supply controls before loan rates have been reduced sufficiently to discourage output. To do so would accumulate tremendous surpluses and bring back commodity programs. That would bring back high support prices, and large Treasury costs, and in general take us two steps backward, after taking one step forward.

I also have suggestions for a food security reserve and a long-term easement program to remove some excess capacity, to help keep prices from falling to lower levels, and to preserve erosion-prone land.

In closing, I reemphasize my major points: (a) set loan rates according to moving average of past market prices; (b) keep target prices where they are for a time, but scale them down to focus more of the benefits on midsized and family farms over time; (c) end incentives for producers to increase output to obtain more commodity program benefits; and (d), eventually terminate supply controls.

In the short run some supply controls may be necessary to work down stocks of wheat and also to keep stocks of other commodities from accumulating to very high levels. But as loan rates are reduced, market prices eventually will take care of these surpluses.

That ends of my statement.

The CHAIRMAN. Thank you, Dr. Tweeten.

I can see why you like this guy, Ed. I am anxious to hear them discuss among themselves some of the points that have been made here, and we will get to that a little later.

All right, Dr. Gardner, professor of economics, University of Maryland.

Glad to have you here, sir, you may proceed.

STATEMENT OF DR. BRUCE GARDNER, PROFESSOR OF ECONOMICS, UNIVERSITY OF MARYLAND, COLLEGE PARK, MD

Dr. GARDNER. I am Bruce Gardner from the department of agricultural and resource economics at the University of Maryland.

My remarks are addressed to the idea of reducing production as a way to solve the economic problems of U.S. agriculture. Higher market prices would do a lot to solve these problems. The most basic economics tell us that if you cut back output, prices will rise. Therefore, it is natural and tempting to advocate production controls to solve farmers' problems.

The message that I want to deliver is that this temptation should be resisted. In fact, I believe that the biggest disaster that could come out of the 1985 farm legislation is to enact a bill that attempted to raise farm prices substantially by means of production controls. My discussion will be devoted to explaining this conclusion.

First, I admit that production controls, carefully managed, can sometimes be beneficial. When Government stocks become extremely large, as in wheat and dairy products, in recent years, and support prices cannot be reduced, a temporary production cutback may be the least-cost approach to resolving the problem.

In addition, as long as a cutback in U.S. exports has an effect of increasing world trading prices, this gives us some international market power, and a program that reduces U.S. production will transfer some income from foreign buyers to U.S. producers.

Law 480 without seriously undermining the incentives of indigenous producers in developed countries around the world.

I think one of the great myths in American agriculture is that with demand expansion we can solve our farm problem. Some reduction in supply is necessary.

Senator MELCHER. Thank you. I will get back to this.

The CHAIRMAN. Senator Zorinsky.

Senator ZORINSKY. I would like to place my opening statement and an opening statement by Senator Leahy in the record.[1]

The CHAIRMAN. Without objection, it is ordered.

Senator ZORINSKY. Thank you, Mr. Chairman.

Dr. Gardner, have you ever been in private business in a position of meeting a payroll?

Dr. GARDNER. No. I have been working in the socialized sector of the university.

Senator ZORINSKY. Have you ever experienced the thrill of the discount or the rebate in the open, highly competitive marketplace?

Dr. GARDNER. Well, when I was younger, before I started teaching.

Senator ZORINSKY. When a businessman is in the marketplace giving extended terms to accounts receivable and trying to sneak away a customer from somebody else, as long as it is within the law, there are many options available. Currently, that is what is being done for farmers of other countries by their countries' treasuries.

Your hypothesis is that the cheaper we sell the food, the better shot we have in the international marketplace. My point is that the price can get so low that there will be nobody left to produce the food.

For instance, Canada nationalized their railroad. They equalized transportation costs on grain shipped regardless of where a farmer produces it, which hurts our farmers' ability to compete because of the transportation differential. Other countries are borrowing from the IMF and World Bank and using the money to subsidize their farmers, making it very difficult for us to compete with them.

We have a cheap food mentality. Only 14 percent of our disposable income was spent for food. The rest of the world averages anywhere from 50 to 80 percent. We must devise some mechanism in our farm policy that gradually shifts a slightly larger portion of the cost from the taxpayer to the consumer, while isolating that domestic price from the world marketplace.

Can we isolate the two, domestic price from international marketplace price? In other words, can we make our farmers healthy, make the consumers pay a little more for their food and increase our exports?

Can you comment on that?

Dr. GARDNER. You could do what you are suggesting. You could charge U. S. consumers higher prices and lower prices on the world market. The key question is, do you want to do that? I do not think that it is a good policy to do that. I do agree though that there are strategic things you could do with reference to these other countries whose policies harm our export interests, things like threats of subsidies. And perhaps spot carrying out of those threats with subsidized sales in very specific circumstances can lead to the kind of desirable outcome you are talking about. But I would not want to see a general export subsidy scheme.

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[1] See p. 191 for the prepared statement of Senator Zorinsky and p. 192 for the prepared statement of Senator Leahy.

Senator ZORINSKY. When you are in business and you start hurting **your competitors, they start talking to you. I am drafting a** farm bill in that vein, and I have had 6 or 7 embassies call me and ask if I could tell them about the new farm bill they hear I am proposing. This is good news for me because any time a competitor can be concerned about what you are thinking of doing to their business in the international marketplace, you are headed down **the right road. We have to enable a farmer to stay in business but that is not accomplished by letting him complete in the world market**place at a price below his production costs.

Dr. TWEETEN. Selective uses of subsidies can be helpful. I do not want to rule them out, but we have to be very careful because when competitors retaliate we very often are hurt more than anybody else. Just because there is a lot of imperfect competition in this world, and no economist I know thinks the world is perfect competion does not mean that other countries gain from their trade barriers. In most cases the presence of these barriers hurt the countries imposing them. One of the ways we can get rid of the barriers or subsidies is by being very competitive. For example, when we had a lower value of the dollar, the Common Market was about to change its common agricultural policy because the required subsidies were getting too great. That was one way to break down that policy. It is foolish in trying to hurt them with trade barriers or subsidies that hurt yourself more, and many of the proposals that I hear would accomplish exactly that. If they want to do something foolish, we do not need to follow their kind.

Senator ZORINSKY. I am not proposing to hurt them. I am proposing to meet what they are doing. That is called competition. That is called free enterprise. That is called the marketplace, and I have found that every competitor that has refused or failed to do that did not remain in business.

Every time I turn around and want to compete with a country everybody says not to do it, that we are going to get hurt. I do not want to hurt anybody.

Dr. GARDNER. There is a question of who is paying. If you are in private business doing it, then your business puts up the money; but if you are a government doing it, you are putting up the taxpayers' money.

Senator ZORINSKY. As a taxpayer, I am putting up the money to support the military. Are you saying we should not be able to defend this country militarily? I want to defend this country economically. As somebody pointed out here, if you are producing too much, the boss signals to the production line to slow down. If we are going to continue to overproduce and destroy our agriculture we are not going to be able to compete in the world marketplace, **because we are not going to have any world market.**

Dr. TWEETEN. Let me ask you this, Senator.

How would you go about competing with the European communities and their subsidies?

Senator ZORINSKY. I think this country's great strength is our long-term lending capacity. We have always been good at that.

I am not suggesting we give more credit or lower prices than anybody else. I am suggesting we give at least equitable prices and equitable credit terms in order to get those customers away from other sellers.

Dr. TWEETEN. Even if you get them back, the fundamental problem in the European Community is not the subsidies. It is high domestic price supports. If you get them to cut back on their wheat exports, all they are going to do is keep their wheat at home, and stop importing our corn and soybeans.

The fundamental problem is to deal with their high domestic subsidies.

Senator ZORINSKY. There was a time when people bought American products because we had good products and they were reasonably priced. Today, nobody is going to buy from us because our flag looks prettier than somebody else's flag. That is the real marketplace.

Thank you, Mr. Chairman.

The Chairman. Thank you, Ed.

I am the low man on the totem pole. I am last, but you have another shot at it, when you wish, Senator Heflin.

I have detected a number of anomolies here this morning, but general agreement when you peel off the veneer, that the present farm policies and programs are not working. I do not think one of the five has disputed that, but I think the bottom line can be found here.

When you asked the farmers what they prefer, that does not mean they like it, but given the options that are confronting this Nation and the American people, table 38 of this very fine study shows that up to 75, maybe a little bit more than 75, percent of the farmers think that the United States should balance the budget, even if all Government programs, including farm price supports, must be cut.

Out there we do not sometimes regard the average guy, the farmer, as being very sophisticated in his economic thinking, but he understands what inflation and high interest rates have done to him. He wants it stopped, and he instinctively understands it is not going to happen until we get the house in order here in Washington, DC.

I find myself in a position of agreeing with everybody at the table, but the disagreements are about details.

I had some statements to be made. Let us set the record straight on PIK. That was an appropriated expenditure, $9.8 billion.

The Appropriations Committee changed that, and it was a net loss to the CCC, and all that. Mention was made of textiles playing off against grain. We are still being flooded, sir, by Chinese textiles. Those boys are in the business of looking after themselves, and they are even disputing the right of the United States to check and see what is really in those great big kegs and boxes that come in here. They label them as scrap material, and when you open them up, they are sweaters. So they are looking after themselves, but you had better believe that they are not thinking about the political aspect. They are looking for the price.

They went to Argentina for their wheat, because Argentina was selling it at a lesser cost than ours.

One or more of you said there is no free trade, and that is absolutely true. It is not free if it is not fair. Ed, I have already talked to Senator Lugar about having perhaps a joint meeting of the Foreign Relations Committee and Agriculture, and both you and I sit on that, and Dick Lugar is the second ranking Republican on this committee, and he is chairman of Foreign Relations Committee, and he has an interest in trying to work this thing out, and looking to see what we can do.

The truth of the matter is that we have been negotiated out of our shoes in the trade agreements, and we have to take a look at all that, and see how it has played off against not only the American farmer, but across the economic spectrum. That is the thing that we have not done, and I think it is without precedent that the Foreign Relations Committee and the Agriculture Committee have sat down together, but I think it is time that we do it.

All right, now, we do agree that we should move toward market orientation after we define it, after we understand the problems, and after we agree on what is the proper timing.

Any disagreement with that among the five?

Dr. DANIEL. And after we adjust the inventories and control excess capacity.

The CHAIRMAN. You are not going to adjust the inventories until you adjust the others. They talk about fine-tuning. We have to have 16 wrenches at one time to try to fine-tune the mess we are in.

Dr. DANIEL. The world market determines the supply and demand, that is clear. It does not have to however, beat lower prices.

The CHAIRMAN. The way I understand the free enterprise system, and I have got 5 minutes remaining, is that the market determines that, whether it should be or should not be.

Dr. DANIEL. The U.S. determines prices in the international market. We dictate prices, because we have the largest excess supply in the world.

The CHAIRMAN. I had one or two questions here.

Dr. Guither, as I understand what I have heard this morning, and especially from you, I think the farm bill that we have put together is not the Helms' bill, it is a collaboration of a lot of folks. I am not smart enough to put together a farm bill, do not pretend to be.

But that bill, have you looked at it?

Dr. GUITHER. No.

The CHAIRMAN. What they call the Helms' bill?

Dr. GUITHER. No. I have seen the report, but I have not read the whole thing.

The CHAIRMAN. I am going to give to you a copy, and I would like your criticisms. I think you will find we have adopted a number of the policies that have been advocated to one degree or another here this morning, and which seem to me to be favored by a majority of farmers, not all of them, to be sure, certainly in terms of the study that you have, and I want to compliment you on that.

If I may, I would like to ask you to take a look at that, and give me your suggestions, because nothing is cast in stone in the legislative process in this Congress. I have been around here a few years, and I know what a spreadsheet means. It means you take your pick, or throw it out, or have a combination, or whatever.

Let me ask you about Jack Block. He has said that there are three basic policy options for the farm bill. He said we can continue the present loan rates, one. We can move toward a market-oriented farm policy, and the key words are "move to."

Nobody is saying jerk the rug. Certainly I am not. Or we can have higher loan rates.

Now, a market-oriented farm policy, must be in concert with all of the things that Congress is supposed to do now, not next year, such as getting this whole economy straightened out, and getting the interest rates down. I submit to you gentlemen that the best farm bill we could write may not even have agriculture in it, or farmer, or farm, or commodities.

If we get this budget on the way toward being balanced, get the interest rates down, I think you will find most farmers, at all levels, will say "Glory Hallelujah."

As far as Ed Zorinsky, he and I have been singing from the same hymn book on this business for a long time. I told George Schultz the other day in a conversation—I said, you have a European desk, and you have a South American desk, and you have an Asian desk, let us have an American desk over there for a while, and see what we can do about looking after our own folks.

I just cannot believe that a farm policy built on yielding to the other guy all the time can work. I have been trying to make that point on the Foreign Relations Committee, as well as here.

I appreciate each of you gentlemen coming this morning, and you devoted an enormous amount of time to the preparation of your testimony, and I want to thank you for that.

I have a couple of minutes, and I will yield that to the Senator from Alabama, for whatever he wants to say. I have to go to a luncheon, sort of a command performance. I wish you gentlemen would go back and forth with these Senators here, and just let them pick your brains, and you pick theirs, and I guarantee you that the transcript of this testimony this morning will be read by a lot of Senators.

Senator Heflin, you can proceed.

Senator HEFLIN. Thank you, Mr. Chairman.

Dr. Daniel, you suggested in your testimony that export market development programs should be funded at a much higher level. I have really two questions for you:

Do you feel that these existing programs are sufficient to increase the U.S. share of the world's export market, No. 1?

And, No. 2, if not, do you have any suggestions for new market development programs?

Dr. DANIEL. I think when we deal with market development programs we have to remember it takes more than 1 year to get results. We currently have a serious short-term problem in agriculture of excess surpluses. Market development programs will certainly help and in the longer term really expand our markets. Currently agriculture is in a desperate situation and it needs all the help it can get.

We did a study with the Soybean Association showing that for every dollar they spent on market development activities $48 was received back. Our analysis also showed that the wheat program is even more attractive. For example, every dollar spent on wheat market expenditures returned $100 to the U.S. farmer.

The U.S. wheat program is an excellent example of how to expand markets, but the current surplus is too large for them to overcome in the next 2 years.

Senator HEFLIN. Do you have any other suggestions as to development programs?

Dr. TWEETEN. I am very concerned about the district judge's decision the other day to require that GSM-5 and GSM-102 shipments be in American bottoms. That has removed those credit instruments as a device to promote agricultural exports. In many cases those credit forms of assistance were decisive in making a sale. To remove that tool in my judgment is a major mistake. I strongly recommend that Congress take whatever action is necessary to reinstate those provisions because the requirement for American bottoms totally offsets any credit assistance offered. It has rendered the credit assistance as null and void as a means of promoting U.S. agricultural exports.

Senator HEFLIN. Does anyone else have any suggestions as to any new or different export market development programs?

Dr. DANIEL. We are restricted in other countries. We could have value added to our agricultural products and exports, and that is restricted against us because of the import embargoes. We could expand our demand for poultry, say, from your State, in other countries if we were allowed to import it, but they have a restriction on it. You could have tremendous expansion in a market by sending feed for poultry and shipping that over there, for beef and pork, but our biggest problem is we are restricted from doing that. I can suggest some significant ideas for you, but unless you let the other guy or make the other guy allow you to do it, you cannot do it. That is our problem.

Dr. TWEETEN. I would like to say by far the most important thing we could do in the long run would be to promote economic development in developing countries around the world. That makes them better customers. Getting our fiscal house in order and thus bringing down real interest rates would do a great deal to reduce the debt crisis experienced especially in Latin American countries and would make them much better buyers of our farm commodities.

Finally, and this is probably the most difficult, opening our markets for their commodities will make them better customers for our farm products.

Senator HEFLIN. Do you think there is any danger as we go into the developing countries that we make them competitors? For example, I understand Zimbabwe is now becoming an exporter of corn. We probably furnished them some of the technologies and some of the information necessary to do it. I mean is that a threat or not?

Dr. TWEETEN. On the whole, promotion of economic development, particularly in developing countries, produces a major net new market for our farm products. You can find exceptions, but we could look at Japan, Korea, Taiwan, and other countries for favorable examples. One of the finest things that could happen to our farm export markets is to have substantial economic progress in those countries because they spend a high proportion of their additional income for food imports.

Senator ZORINSKY [presiding]. Senator Melcher.

Senator MELCHER. I will continue on the same series of questions I had before.

I gave four premises and I asked you to accept them, and perhaps one of those you could not accept, so I will see if we can accept three premises.

The world food production currently matches nutritional needs. If there is any excess, it is not an adequate world reserve.

The second premise, which I think you can all accept, is that 15 to 20 percent of conservation or soil erosion control benefits should be made.

The third premise is that there is an ongoing shift throughout the world from this consumption of cereal by humans to a broader concept where you use the cereals through animals in one way or the other, chickens or dairy cows or hogs or cattle.

The fourth premise, which I do not think you can accept, is the point I want to address. It does not seem likely you can accept this premise, that we must maintain U.S. production on 80 to 85 percent of the land that is farmed or grazed in order to meet the world needs and capture a bigger portion of trade.

It is on that premise, I think, things broke down. Dr. Knutson talked about the high necessity of conservation of land. I want to accept that as a premise. I do not know how we have a mandatory conservation program. But let, us assume it and accept the premise we have.

Then, Dr. Daniel mentioned $20 to $30 billion in costs. I guess that is on the premise you are going to set aside everybody's nutritional needs. I am not stipulating that or attempting to devise that as the question. Dr. Daniel asked what countries should be helped: Communist, non-Communist, friendly, unfriendly. We trade with Communist countries so I do not think that is our bugaboo.

Dr. DANIEL. Are you going to pay for it?

Senator MELCHER. I think that is a policy question. What I am proposing is something similar to Public Law 480, section 416 or whatever, but something similar to those proposals where we subsidize the interest.

Dr. DANIEL. I agree wholeheartedly you can expand demand by giving away food. That has been shown time and time again.

The question is who is going to pick up the bill, and know how much it will cost.

Senator MELCHER. That is the question.

Dr. DANIEL. I do not know how many people you want to feed.

Senator MELCHER. How big a bill? Someone mentioned $21 billion for 1983 on supply control programs. I would say we can cut down drastically from that level, which is an outrageous level, and in fact cut down this year. I think you will find that most Democratic Senators believe we should.

The question is how you use your money.

Dr. **Daniel.** I agree. The question, No. 1, is do I have any money, and that is why I suggested a mandatory control program because I assumed Congress was not going to spend very much for farm programs. You are going to have to do that to be have any impact without Government spending.

Senator **Melcher.** In every one of these programs, did you take out anything?

Dr. **Daniel.** I said maximum $5 billion.

Senator **Melcher.** You mean above where we are?

Dr. **Daniel.** Total.

Senator **Melcher.** For 1986 it would be hard for me to compute exactly. I think we have got a figure of slightly less than $10 or $11 billion on the administration's bill.

Dr. **Daniel.** I agree.

But I want to make clear——

Senator **Melcher.** You want to cut that?

Dr. **Daniel.** If you are going to get the Government out of paying large subsidies to agriculture, if that is the objective of Mr. Stockman and Mr. Reagan, that we are not going to give the farmer anything, the only hope is to raise prices by cutting back supplies.

Most programs, if you keep the target price at current levels, which means you keep farm income up and you lower the loan rate, you spend more than $10 billion and you will exceed the budget. Say now we have $15 billion to spend, the big dilemma you are going to have is what to do with $5 billion more. Should it be export giveaway programs or direct farm subsidies?

Senator **Melcher.** What about cutting back on the target price and going up on the other end? That was my question.

Dr. **Daniel.** Going up on the exports, right?

Senator **Melcher.** Right.

Dr. **Daniel.** How high do you want to go? Ten billion? All of it?

Senator **Melcher.** You mentioned or you said $10 to $20 billion, and you say we have got so much corn and so much wheat. I added that up. It did not throw in dairy, but I will throw it in and you have got about $5 billion.

Dr. **Daniel.** We already have a giveaway program in dairy. In Public Law 480 we have got all grain commodities. You are asking me is that what I would do. Remember direct subsidies give the farmer more per Federal dollar spent than do other programs.

Senator **Melcher.** Let us talk about the program we are talking about, which is production control.

Dr. **Daniel.** Production control is on tobacco.

Senator **Melcher.** I am talking about food.

Dr. **Daniel.** Let us keep it on the feed grains.

Senator **Melcher.** We are wasting time, Doctor.

Dr. **Daniel.** Let me answer this quickly.

If you are saying that you have that money and you want to expand your export market—I think that is what you are asking.

Senator **Melcher.** Yes.

Dr. **Daniel.** Then you can expand exports. The real dilemma you have then is that you are effectively expanding a new market and not replacing cash markets and that you do not destroy the agriculture of recipient countries.

Senator **Melcher.** I think that is the key.

Dr. **Daniel**. If you do that, you are going to get in trouble.

Dr. **Knutson**. There is one other point, too, and that is the point Dr. Tweeten made, that if you go too far with Public Law 480 there are studies that show part of the problem in Africa may be that they have been unwilling to pay their producers enough in terms of prices. And if we dump food on them, it complicates that particular problem.

Senator **Melcher**. You are talking about starving versus market development. You can get a little bit of market development by saving somebody's life.

But that point, Doctor, is exactly what I am coming to. You talk about Africa and what their needs are, and the key point is what Dr. Daniel just said: That you are developing a potential market. Is that not part of it? You spend part of your money just to save lives in Public Law 480, section 416, or anything we want to devise, but actually are we not really talking about developing the market?

Dr. **Tweeten**. No, I do not think so because if we are talking about Africa——

Senator **Melcher**. No, we are not just talking about Africa.

Dr. **Tweeten**. That is where a lot of the Public Law 480 money is going.

Senator **Melcher**. Put that aside. Africa is a case of starvation. I am not sure that in using Public Law 480 or section 416 for market development that that is the best place to look. I think there is some spinoff on helping save somebody else that they might gain utilization of the food and want it in the future.

But let me continue because I want to respond to what Dr. Guither said. He said Public Law 480 does develop markets through a long-term process. I have suggested 10 to 15 years, which is not as long as some. Someone mentioned rice. The biggest group of rice producers in Texas now sells to the Saudis about, I think, 30 percent of their dollar value utilizing 20 percent of the crop. This was something that started 25 years ago, I suppose. So it is a real long term. But I have suggested 10 to 15 years because that is about how far we can look ahead here in this committee. Part of the long term has to be that you have to develop a taste or an acceptance of the food and then assure its continued availability. You do not necessarily give it away. You may give part of it away and you may sell part of it at a reduced price.

Dr. **Tweeten**. It is a judgment call, Senator, but it is my judgment that if we were to expand substantially our Public Law 480 to basically commercial importers, we would soon get into a trade war with retaliation that would in essence simply transfer income from the United States and other exporters to the importing countries, and the addition to our net income or long-term sales would be minimal.

Senator **Melcher**. Where you supply wheat where there is not any wheat and there is not going to be any wheat, at least in this generation, or where you supply dairy products where there are not any dairy products and there are not going to be any dairy products, obviously you would be doing it for trade development as well as humanitarian reasons.

Now, are you saying that because that might incite trade wars we should not do it?

We ought to loosen up and remove some restrictions and redtape on Public Law 480. We have done that on section 416, but section 416 only applies to two commodities. These are valuable tools to build trade. True, there is a humanitarian part, but the goal also is to build trade.

Dr. TWEETEN. I think there are places where you can do that, but I am just saying it is limited.

Senator MELCHER. Limited?

Dr. TWEETEN. Limited, yes.

Senator MELCHER. Let me give two examples. You cannot get any wheat down in Mexico when you want it. There are 82 million people there and they are growing. They are not going to have significant wheat crops in this generation. You cannot even grow wheat in the Southeast Asia area and you have got 52 million people in the Philippines. For a while they were steadily increasing their consumption of American wheat. By the way, American wheat is the only wheat they buy. Those are pretty big markets.

Dr. TWEETEN. I do not think any of us here are opposed to trade promotion. The point I want to make is it is not a solution to farm problems.

Senator MELCHER. You said wheat is in the worst spot.

Dr. TWEETEN. That is right, and trade promotion alone is not going to solve the problem.

Senator MELCHER. Per capita we do not really eat all that much wheat. When it got cheaper we consumed more in this country, but that was through chickens, hogs, and cattle. It did not go direclty into our bellies. I just named two countries, one of which has 82 million population and is not going to have any wheat production of any significance in this generation and one with 52 million people that will never have, at least in the judgment of their agricultural people, any wheat production.

I am saying why not bring them up to us?

Dr. TWEETEN. It will take a number of years to do it.

Senator MELCHER. Of course it would. That is why I said 10 to 15 years, and even that may be too short. But we are talking about two countries, if they eventually consume like we do, who would have a demand for 40 or 50 million bushels. Yet you are saying that we are 500 million bushels over what we should be.

Dr. TWEETEN. We are 500 million more bushels than we should be, but we cannot wait 15 years to deal with that.

Senator MELCHER. I will grant that. There are a lot of other countries with smaller populations that are potential markets.

Dr. GARDNER. Can I raise a problem about trying to do it on a large scale? If you think about a period of 15 years there is a problem with wheat, even if it is true that when people get a taste for wheat there is a steady market there. Even so, they are going to proceed to buy it from where they can get it cheapest. What you have got to ask over the longer term is not just how expanded demand in these countries looks relative to our production but relative to world production. They will be looking around the world to see where else they can buy wheat. We have a similar problem with this long-term effect of market promotion as we do with production controls. That is to say, we improve the world demand for wheat, but everybody then can try to satisfy that demand with their own production.

Senator MELCHER. There are people on this committee who have already moved beyond that problem. The things we do around here will probably get locked into pretty firm reciprocal agreements or they will not get done.

Trade is a tough deal, but I just mentioned the Philippines. They have not bought 1 bushel of wheat from anybody else in the last 12 years. Not one. I would say it is a big market. We simply have to get in these markets and make the deals and reciprocal trade agreements that they have to live with.

Dr. GARDNER. The other thing you have to watch out for is when they start buying wheat they do not stop buying something else like rice. We export rice, too.

Senator ZORINSKY. Thank you, gentlemen. We appreciate the time you have given us and your expertise.

On behalf of the committee, the Chairman, and the other members, I want to thank you for your testimony.

We are adjourned.

[Whereupon, at 12:48 p.m., the committee recessed, to reconvene, at 10 am., Tuesday, March 19, 1985, in room 328-A, Russell Senate Office Building.]

FRAMEWORK AND ANALYSIS FOR AGRICULTURAL POLICY IN 1985

Impact of Technology and Research

TUESDAY, MARCH 19, 1985

U.S. SENATE,
COMMITTEE ON AGRICULTURE, NUTRITION, AND FORESTRY,
Washington, DC.

The committee met, pursuant to notice, at 10:10 a.m., in room 328-A, Russell Senate Office Building, Hon. Jesse Helms (chairman of the committee) presiding.

Present: Senators Helms, McConnell, Zorinsky, Leahy, Melcher, and Boren.

STATEMENT OF HON. JESSE HELMS, A U.S. SENATOR FROM NORTH CAROLINA

The CHAIRMAN. The committee will come to order.

Today's hearing is the third in a series of five thematic hearings which will assess the impact of technology and research on farmers, and particularly as it relates to farm policy.

I think it is clear that we have seen an agricultural revolution in the past 50 years, and I believe that today's witnesses will inform us that the revolution is not over. In fact, it may be just beginning.

But one thing is for certain. This committee cannot expect to reauthorize farm legislation without taking a serious and careful look at the technologies of the future. Without some recognition for the impact that research and technology have upon the U.S. agricultural sector, we are likely to write misguided and ineffective farm legislation, and to the length of this Senator's cable tow, that is not going to happen.

In July 1983, the Senate Agriculture Committee joined with five other congressional committees in requesting a study by the Office of Technology Assessment. The study was to address and analyze the relationship between emerging agricultural technologies and public policy, and structural change in the farm sector. This study has now been completed and will be presented at today's hearing and simultaneously released to the public. I hope the public will take note, particularly some of our editor friends and commentators on the broadcast stations.

Many of the changes brought about by advancements in technology run counter to the underlying goals of U.S. farm policy. In each farm bill reauthorization since the Agricultural Adjustment Act of 1938, this committee has attempted to enact policies to keep

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as many farmers as possible in business with price supports and credit assistance and various other programs.

By all measures, technology and the economies of size have outpaced efforts to maintain historical farm populations. Over 30 million people have moved off the farm since farm programs began in the 1930's. Advancements in research and technology have resulted in significant structural changes in our farm sector. Farm output has doubled since the 1930's. Overall efficiency has increased 2½ times. In the 1930's, it took over 30 percent of a consumer's disposable income to buy food, and today, this figure has declined to 16 percent, which is the lowest of any nation in the world.

While this success story may be the envy of the world—and it is—it has not come about without creating difficulties for some farmers and for U.S. policymakers. The number of farms has declined to 2.2 million, down from 6.8 million back in the 1930's. In the 1930's, farmers accounted for about 25 percent of our population. Today, their numbers have decreased to less than 3 percent. Research and technology have created a capital-intensive agricultural sector.

We have called upon a distinguished panel of experts from three universities to outline some of their research activities and the impact this technology may have upon U.S. farm policy.

This morning, we will have two panels, the first consisting of Dr. Michael J. Phillips, Project Director, Food and Renewable Resources Program, Office of Technology Assessment, U.S. Congress, Washington, DC, accompanied by Dr. James W. Richardson, Department of Agricultural Economics, Texas A&M, in Texas, and Dr. E.R. Eddleman, professor and economist, Mississippi State University in Starkville, MS.

Gentlemen, welcome to the committee, and thank you for your cooperation with us. I know you have spent a great deal of time in preparation for this hearing, and I assure you that, while the Senators are tied up on various committees, the record of this hearing will be made available to all Senators, and it will be studied carefully.

Now, as I understand it, Dr. Phillips, you have a presentation. In each case, of course, we will reproduce in the record the full text of your statement. If you care, you may summarize or whatever you wish to do.

You may proceed, and welcome, each of you, to the committee. Thank you.

STATEMENT OF DR. MICHAEL J. PHILLIPS, PROJECT DIRECTOR, FOOD AND RENEWABLE RESOURCES PROGRAM, OFFICE OF TECHNOLOGY ASSESSMENT

Dr. Phillips. Thank you, Mr. Chairman and members of the committee. I want to thank you also for inviting the Office of Technology Assessment to appear before you today to release findings from the first part of a major study that this committee and others requested, which will provide information for your consideration in drafting the 1985 farm bill.[1]

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[1] See p. 224 for the prepared statement of Dr. Philips.

The study, "Technology, Public Policy, and the Changing Structure of American Agriculture," projects the most likely picture of U.S. agriculture by the year 2000, by analyzing the relationships between emerging agricultural technologies, public policy, and structural change in the farm sector.

Although the entire study will not be completed until late 1985, we find some findings from the study are relevant to the debate of the 1985 farm bill. We have prepared and today transmitted to the requesting committee the first of two reports, which is entitled, "Technology, Public Policy, and the Changing Structure of American Agriculture: A Special Report for the 1985 Farm Bill."

Today, our purpose is to briefly describe some of these new technologies, discuss their impact on future yields and total production, and indicate their likely impact on structural change and agricultural policy.

Technology has made U.S. agriculture one of the most productive in the world, and some of that technology has taken the form of new products; other technology has been embodied in new processes, such as the ability to use computers and make better economic decisions, or apply the best combination of cultural practices. Emerging technologies encompass both products and processes, and like their predecessors, promise to reshape agricultural practices. Indeed, recent breakthroughs in biotechnology and information technology could revolutionize agricultural production.

For instance, before the turn of the century, cattle ranchers may be able to raise cattle twice their present size with no additional feed. Dairy farmers may be able to control the sex of calves and to increase milk production without increasing feed intake. Major crops may be altered genetically to resist pests and disease, to grow in salty soils and harsh climates, and to provide part of their own fertilizer. And new computers and electronics will be used to increase farm management efficiency.

These are only a few of about 150 emerging technologies in 28 technological areas, which we have noted up here on the first chart, that have been identified and evaluated in this study. And, while it may sound somewhat like science fiction, advances in biotechnology and information technology will make these technologies a reality in the very near future.

My written testimony details some of the specific advances here in biotechnology and information technology which will make this possible. It will suffice to say at this point that technical advances in the mass production of micro-organisms of proteinaceous pharmaceuticals, gene and embryo manipulations in animals, micro-bioinoculums and genetic modifications in plants, and the integration of computers and electronics into modern livestock production systems will account for many of these breakthroughs which will dramatically change agricultural production.

The basic question is, really, what do all these technologies mean, then, for agriculture. First, it should be noted that for plant agriculture, many of the biotechnology developments still are a number of years away from commercialization. A great deal of basic research needs to be done before many of the promising areas of biotechnology can be realized. The earliest to look for some of these breakthroughs is the early to mid-1990's. That means that we will continue to rely on conventional techniques and plant breeding programs until that time.

Yield increases for corn, soybeans, and wheat will range from about 3.5 to 8 percent nationally until 1990—I think you will see that on the next chart we have up here. However, from 1990 to 2000, when some of the new technologies are available, yields should increase by 15 to 17 percent in these commodities.

Now, in animal agriculture, we have a much different situation. The technologies are here today, and they will have a major impact for the remainder of the century. This will be the case especially for the dairy industry. We estimate that if the present economic environment and policy programs remain unchanged, technological advance will have the potential to increase from 1982 national milk production per cow by 14 percent by 1990, and 43 percent by the year 2000. This translates into a 2-percent-per-annum increase in potential milk production from now to the year 2000.

Such a dramatic increase in milk production potential, coupled with a relatively static demand for milk products since the late 1970's, indicate a continued and a worsened surplus situation for the dairy industry.

Our next chart shows the projections to 2000 of increased production, which includes additional land resources as well as new technology for three major U.S. export commodities. Under the baseline, or most likely environment, corn production, for example, is projected to increase at a rate of 1.8 percent a year from 1981 to the year 2000. However, without the new technologies examined in this study, the rate of growth would be only 1.2 percent. Under the more new technology environment, corn production could increase at a much faster rate—about 2.2 percent per year. We see about the same growth rates were obtained for wheat production, and a more drastic increase in soybean production is projected from now until 2000, regardless of what environment you are looking at.

Out of a predicted 1.8-percent annual increase in production to meet this world demand, only three-tenths of 1 percent will come from increased quantities of land used in production for the next 20 years. The other 1.5 percent will have to come from increases in yields, mainly from new technology. Thus, to a very large extent, research that produces new technology will determine the future world supply/demand balance and the amount of pressure placed on the world's limited resources.

The OTA results indicate that with continuous inflow of new technologies into the agricultural system, U.S. agriculture will not only be able to meet domestic demand, but also contribute significantly to meeting world demand in the next 20 years. This does not necessarily mean that the United States would be competitive or have the economic incentive to produce. It merely means that the United States will have the technology available to provide the production increases needed to export for the rest of this century.

Advances in biotechnology and information technology will be needed for the United States to compete in the international marketplace. However, the potential impacts of adopting these technologies have important policy implications for Congress as it begins debate on the 1985 farm bill.

One impact will be technology's role, along with current public policy, in creating a surplus of certain commodities, notably dairy products, in the immediate future. The implication for policymakers is the need for a farm program that more easily allows for adjustments in periods of shortages and surpluses, rather than remaining fixed. For example, dairy price supports could be designed to adjust to increased production and lower costs spurred by technological advance. This could be accomplished either by adjusting the price support level to changes in production costs per unit of output, or by adjusting the level of CCC purchases.

Another impact of technology will be its continuing role in changing the structure of the agriculture sector from a system dominated by the moderate-sized farm to one dominated by large and very large industrialized farms.

For example, in the dairy sector, our analysis indicates that with the adoption of emerging technology, and present public policies, there will be a continued trend to fewer, but larger, dairies. Regionally, milk production can be expected to continue to increase in the large-scale, lower cost, Southwest region, to the detriment of the traditional, moderate-size operations in the Lake States and Northeast regions.

In addition, the technologies a farmer now needs to remain competitive are going to be costly and complex. Farmers who lack the capital and expertise to adopt technology early enough to maintain a competitive edge probably will have to seek supplementary off-farm income, find some special niche for their products, or they may have to give up farming altogether.

This last alternative has become a familiar picture for the moderate-size farm which is fast disappearing from the agricultural scene. Since 1974, net income of moderate farms has decreased from 21 to 15 percent of total farm income in 1982. In contrast, net farm income to those farmers with sales in excess of $200,000 grew from 35 to 84 percent in the same period. You can see that on the last chart that we have.

Very large farms—and here, we mean farms with sales in excess of $590,000—have been responsible for the majority of this growth. This class, which accounts for only 1.2 percent of all farms, increased its real share of net farm income fourfold—from 16 to 64 percent. As a group, these large and very large farms are relatively well off. As the moderate farm drops from the middle of the farm spectrum, it leaves small and part-time farms clustered at one end, and the large farms clustered at the other.

Moderate farms comprise most of the farms that depend on agriculture for the majority of their income. Traditionally, the moderate farm has been viewed as the backbone of American agriculture. These farms appear to be failing in their efforts to compete for their historical share of farm income.

This trend has several implications for public policy. First, if a decision is made to slow the decline of the moderate-size farm, policymakers must provide ways for making new technologies more available to these farms, and providing training in the use of these technologies. This could be accomplished from both the public and private sector efforts.

For example, cooperatives, whose membership is primarily composed of operators of moderate-size farms, could arrange for "pool buying" of these technologies for their members, and develop training programs for their appropriate use. In the public sector, a tremendous challenge exists for the extension service to transfer these technologies to moderate-size farms early enough in the adoption cycle for them to remain competitive. Dr. Eddleman, if you have questions in this area, will be glad to discuss this further with you.

Second, our analysis indicates that targeting of income support to operators of moderate-size farms could be an effective policy to prolong their survival. And despite the apparent advantages of operators of these very large farms, they still may need a loan safety net to help them weather price instabilities and the rigors of the world marketplace. Unlike most of their moderate-size counterparts, such farms are more likely to survive without income supports. Dr. Richardson will be glad to answer questions that you might have in this area of our analysis.

Third, agricultural policy may for the first time have to include ways to help particular groups and regions make the transition to different endeavors. For example, programs to retrain agricultural workers for jobs in other sectors of the economy may be necessary, or farm operators in a region may need help changing to alternative kinds of farming.

Finally, and perhaps most significantly of all that we say here today, farm programs must be considered in the context of these strong technological, economic, and institutional forces. Farm programs can merely speed up or slow down these forces of change. They cannot reverse the trend.

Mr. Chairman, this completes my testimony for today. Dr. Richardson and Dr. Eddleman would be glad, along with myself, to try and answer any questions that you might have.

The CHAIRMAN. Thank you very much.

As I understand it, both Dr. Richardson and Dr. Eddleman have statements, which will be included in the record.

Senator Zorinsky has agreed to Chair this hearing for a few minutes while I attend another meeting, sort of a command performance.

Before I go, last night I went to a dinner at which several prominent farm people were present, and one or two of the men were saying that we had not done enough in research in agriculture.

Do you share their opinion?

Dr. PHILLIPS. That we have not done enough in terms of providing technology for farmers?

The CHAIRMAN. Yes. Your statement seems to indicate we have done a bit——

Dr. PHILLIPS. Well, between what is going on in the public sector and the private sector, the private sector has done a great deal in the whole area of biotechnology.

The CHAIRMAN. Most of it.

Dr. PHILLIPS. And doing most of it—correct. The public sector is beginning to catch up. But our analysis clearly shows that we have the technology to compete. The concern is getting it transferred out to the agricultural sector, particularly to those farmers in this moderate-size group; if there is the desire to want to prolong their survival in the future, it is going to be very key that these technologies be transferred out, and at an early enough time in the adoption process that they can be competitive.

The CHAIRMAN. I don't believe you addressed how to do that in your statement. I wish you would give it some thought and give me a memorandum on it.

Dr. PHILLIPS. We have it in Dr. Eddleman's testimony.

The CHAIRMAN. Super; that is fine.

Dr. Phillips, let me see if I am correct. You discussed options for the farm bill and included that price supports must be sufficiently flexible to adjust to productivity advances. Is that correct?

Dr. PHILLIPS. Yes.

The CHAIRMAN. The dairy provision in the Helms farm bill would seek to do this by tying the support level to CCC purchases, as you know.

Let me ask you this—and it may be a leading question or may not. If Congress fails to heed your advice and adopts instead an inflexible policy, what would be the implications?

Dr. PHILLIPS. I think the implications would be the same that we have seen in the past, and that is, you will continue to see a vast buildup in our CCC stocks, that somehow you are going to have to eliminate. The advantages of a flexible program are that no one consciously has to go in and keep making decisions at any particular point in time. They automatically make the adjustment, so that that signal gets back into the marketplace, to the farmers, so that you do know what the situation is and what kind of support you can count on.

The CHAIRMAN. If we get a much greater surplus of dairy products, we will fill all the caves in the world.

Dr. PHILLIPS. We sure will. We have the potential to do that, technologically.

The CHAIRMAN. Yes, and this is something that needs to be understood.

Let's say hypothetically that Congress enacts a supply control program. Would individual dairy farmers have to continue to reduce their herd sizes to compensate for increased productivity?

Dr. PHILLIPS. They may have to, yes, but the advantage of that is that a supply control program will help these moderate size operations continue. In our analysis—and Dr. Richardson can elaborate—that is about the only program that really increases their probability of survival in the future.

Jim, you may want to add to that.

Dr. RICHARDSON. Basically, the only policy we found that increased the probability of survival for the typical Minnesota dairy farm, the 52-cow dairy farm, to a reasonable level was the mandatory supply control program which reduced production about 5 percentage points. One problem with this farm program is that the very large farms, the 1,500-cow farms, et cetera, received a great deal of benefit (enhanced net incomes) from this type of program. The Minnesota farm gained about $15,000 to $20,000 in net farm income, while the very large dairy farms gained about $400,000 in net farm income.

The CHAIRMAN. Doesn't it also have an impact on the beef producers?

Dr. RICHARDSON. Yes, sir.

The CHAIRMAN. They have got some problems, also.

One more question, Ed, and then I would appreciate if you would take over. Dr. Paarlberg—do you know him——

Dr. PHILLIPS. Yes. He is on our advisory panel.

The CHAIRMAN. Right. Everybody knows him, and he is a distinguished gentleman. He was here last week, and he suggested that advancements in technology were responsible for the reduction in 33 million farmers since the 1930's. Is that what you were saying essentially in your statement?

Dr. PHILLIPS. It is a major part of the problem. I do not go so far to say it is the only reason. It is the combination of technological advance with policy and with the economics that have caused this change.

The CHAIRMAN. I did not mean to suggest that he said it was the only cause, either, but it played a prominent role.

Dr. PHILLIPS. Yes.

The CHAIRMAN. Now, even if we wanted for some reason to stop the technology advancement, could we?

Dr. PHILLIPS. Well, the United States has no lock on these technologies. If we don't adopt these technologies, you can rest-assured other countries will—in fact, they are. If we desire to be competitive in the world marketplace, we basically have no choice but to adopt these technologies. Our competitors will.

The CHAIRMAN. All right. Ed, I suspect you will want to hear from these other two, and if you will take over, I will be back in just a few minutes.

[Whereupon, Senator Zorinsky assumed the Chair.]

Senator ZORINSKY. Dr. Eddleman, would you like to proceed?

Dr. EDDLEMAN. Yes.

Senator ZORINSKY. If you want to summarize, you may do so. Your entire statement will be placed in the record.

STATEMENT OF DR. B.R. EDDLEMAN, MISSISSIPPI AGRICULTURAL AND FORESTRY EXPERIMENT STATION, MISSISSIPPI STATE UNIVERSITY

Dr. EDDLEMAN. Thank you, Senator.[1]

I will simply say that my role in this particular study was as a contractor. I studied the impact of these technologies as well as farm commodity policies on the Mississippi Delta region. This is one of our major crop-producing regions in the United States, and one in which we have a lot of options in terms of diversification. We can grow seven or eight major types of food grains, feed grains, and fiber crops.

And second, I served in the role of reviewing some of the papers in terms of the implications for agricultural research and extension policy. Briefly, we have found, in terms of agricultural research and extension policy, about five major points for possible consideration in the 1985 farm bill. One of those points is that, as Dr. Phillips said, we are not likely to be very successful—if the goal is to maintain a structure that has moderate-size farms in it—if we just simply focus on research and extension policy. The technological forces—and not just those coming from public research and extension programs—that are underway in the private sector, the role of institutional structures, the role of general macroeconomic policies, the role of domestic farm commodity programs and trade policies simply swamp the technology itself. The technology interacts with these programs to bring about a lot of the dynamic adjustments occurring in agriculture.

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[1] See p. 231 for the prepared statement of Dr. Eddleman.

One of the points we make in the study is the need to integrate research and extension policies with other public policies. Such policies as making sure that there is a readily available supply of reasonably cost venture capital for moderate farms, targeting of domestic farm programs, and perhaps helping to underwrite some of the losses and risks that may be involved in adopting these technologies, because some of them are very risky, are necessary if you want to affect structure through research and extension policy.

The second point we make is that as we look at the public research and extension community, we find that due to a number of reasons, the research community has made a lot of adjustments in terms of setting national priorities and adjusting resources to focus on biotechnology and information technology. We do not find that similar rate of progress coming about in the extension community.

A final point we find is that some rulings—for example, the Plant Variety Protection Act of 1970; the U.S. Supreme Court decision of 1980 that allows patenting and exclusive licensings of both plant varieties and biological technologies and discoveries—call into question the social contract or the conditions under which many of our public universities, particularly our land grant universities, operate. That is in providing free and readily available information to any who desire it.

We find some arrangements beginning to emerge among public universities, both land grant and nonland grant universities, and the private sector that call into question the social contract. As a consequence, we have some concern about the distribution of benefits from these technologies that come from the public sector. In the written testimony I would like to submit to the committee, we discuss some of these issues.

Thank you.

Senator Zorinsky. Thank you, Dr. Eddleman.

Dr. Richardson.

STATEMENT OF DR. JAMES W. RICHARDSON, DEPARTMENT OF AGRICULTURAL ECONOMICS, TEXAS A&M UNIVERSITY, COLLEGE STATION, TX

Dr. Richardson. My role has been that of a contractor. Over the past year, I have been primarily responsible for evaluating the impacts of alternative income tax policies, farm policies, and financial bailout strategies, on producers of different size farms in the Southern Great Plains, essentially, the Oklahoma panhandle, Texas panhandle, western Kansas, eastern Colorado wheat and sorghum farms. I also analyzed the Southern High Plains cotton producers in the Lubbock region.

I have cooperated with Dr. Eddleman and several other contractors in evaluating the impacts of technology, farm policy, tax policy, et cetera, on dairy farms in three different regions of the country, the Southwestern United States, the Southeastern United States, and Minnesota, as well as the Illinois corn/soybean farm, and Nebraska cash grain farm. These analyses have primarily pointed up the fact that the moderate-sized farms as we know them today—$100,000 to $300,000 category—are basically the farms most dependent on farm programs for their continued success and survival. The large-scale farms garner larger total benefits, but the moderate-size farms are in need of those programs just to remain solvent.

Our financial bailout analyses have shown that if we provide either interest subsidies or debt restructuring, the interest subsidy is the only policy that does any good at all. The debt restructuring provides almost no support to producers, and the interest bailout program is not going to be of much help to the highly leveraged producers, or moderate-sized farms, unless they have off-farm income to supplement this additional benefit.

At the bailout rates that are currently being considered we are not providing sufficient benefit to help these farmers come through.

Additionally, the very large farms are better able to take advantage of these interest subsidies and debt restructuring, and they are able to grow and prosper much more readily than the moderate-sized family farms when given this kind of bailout.

Our other results have shown that the Minnesota-type dairy farms are the most vulnerable to removing farm policies. A 50-cent reduction in the support price of milk takes a representative Minnesota dairy farm out of business; it reduces his chance of survival from 75 percent to nearly 40 percent. The larger farms, the very large dairy farms throughout the Southwest and Southeast are able to remain in business with a 50-cent reduction in support price. It reduces their net farm income to lose these price supports or reduced price supports, but they are able to remain in business.

My results are summarized more succinctly in my statement, and I will submit it for the record. Thank you.[1]

Senator **Zorinsky**. Your entire statement will be placed in the record.

In the order of arrival to the committee hearing, I would like to call on Senator Heflin. Do you have a statement or questions for the witnesses.

Senator **Heflin**. You have basically given us an outline of an assessment of technologies on the scene which are designed to increase production. I think one area in which we need probably an emphasis, perhaps a national emphasis program, is research designed to reduce the cost of production to increase profitability.

Now, in your testimony, you have touched on this point, such as the ability of some crops, through biotechnology, to supplement some of its fertilizer needs through biofixation.

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[1] See p. 234 for the prepared statement of Dr. Richardson.

You brought out the fact that some of the major crops can be altered genetically to resist insects and diseases, which could substantially reduce the cost of chemicals. Looking at some of the other ways to try to reduce costs of production, conservation tillage could reduce the cost of production.

Is this the type of research that will have to be developed through universities and through experiment stations, and research there, rather than so much in the private sector. Now, I might be wrong on that, but the idea, of course, would be toward reducing production costs which would reduce sales profit in the private sector.

I just wonder if you have any comments on the need for some type of a national emphasis program, how it could best be conducted, and how it could be carried out relative toward these areas which are within the broad category of research to reduce the costs of production.

Dr. EDDLEMAN. Well, I think you have made a very good point, Senator. I would say there are certain aspects of these biotechnologies that are geared toward reducing the costs of production, particularly, as you mentioned, in terms of the engineering end of pest resistance—insects, diseases, or other pests.

I might mention also that the private sector has turned some of their attention to that, too. But irrespective of that, it seems to me that if you look at the adoption process these technologies go through—and that is essentially that they are integrated into society through the marketplace—there tends to be an output-expanding aspect of even those technologies geared to reduced costs. The larger, more progressive farmers tend to adopt them first, and expand the scale of their operations because they have some profit incentives and some revenue advantages to do so.

But I think that it is quite correct to say that we observed through the past that a substantial portion of our public research has been geared specifically toward output-increasing technology. Productivity was gained by getting more product from the resources that were there. I think we see some change that is coming about in the orientation of the public research, both within the land grant universities and the USDA, to focus more on ways of enhancing profitability and reducing cost, rather than just increasing output from existing resources, because that entails releasing resources in a surplus situation to other sectors of society, particularly those resources of farmers who cannot survive and compete.

So I think this is something that was outside the purview of this study. But I know it is something that does entail a lot of effort, and there is work underway in the experiment stations to look at these kinds of priorities and to look at national priorities with regard to cost-reducing technologies.

Senator HEFLIN. I suppose there are some foundations, too. As I understand it, the Kettering Foundation is one that has been doing a good deal in agriculture, in particular, the replacement of soil nutriets through plant growth, which would reduce the cost of the application of fertilizer. Can you give us some idea of how much is going on in foundations and things of this sort relative to this area?

Dr. **Eddleman**. I personally do not know the magnitude of the research activity that is going on in those foundations, or the type of supported activities. We have just recently, through Assistant Secretary Bentley's office, surveyed the private sector to find out what is going on in agricultural research. A report will be released in very early May. We are meeting in late April to revise the draft of this report that provides a handle on how much is being invested by these foundations as well as the private sector itself. At the present time, I really do not know the answer to that, in terms of either manpower or dollars invested, or just the volume of projects that are underway.

Senator **Heflin**. How much of a problem would it be for your office, the Office of Technology Assessment of the Congress, to evaluate the prospects for the future of research designed to reduce the cost of production?

Dr. **Phillips**. That is clearly the prerogative of the committee to request that, and we would certainly consider that very seriously. I think it is, as Dr. Eddleman says, these technologies, cost-reducing and increased productivity go hand in hand, and they are not separate. You can point out some isolated instances of that, but basically the way in which you do get reduced cost is through increased productivity. And for us to be able to compete in world markets, we are going to have to increase productivity to maintain the share of the world market we have today, before we even think about beginning to increase our share.

Senator **Heflin**. Well, generally, your statements here pertaining to that also indicate that only the large farm is going to be able to stand the cost. I mean, that is the general rule; there are exceptions in different areas. And that moderate-sized farm, small farm, is going to be in a situation of maybe having to lag behind in that, and may eventually be destroyed.

I see that both are integrated together, but to me, I think there is an area in particular that we ought to give some direction to, and that is to trying to encourage a national emphasis program primarily designed toward reducing cost of production, too, which in effect is an area that could help these other size farms.

Of course, machinery is terribly expensive today, and I do not know of any way that research can be designed to reduce the cost of machinery, other than just competition.

But I think it is some sort of an area that we ought to look at, and maybe in writing a farm bill, we can endeavor to give some sort of emphasis toward programs designed to decrease the cost of production, to aid the profitability toward the moderate and small-size farm.

Dr. **Phillips**. If it is any consolation at all to you, Senator, our analysis does show that we do not see these new technologies that are coming onstream to be extremely capital-intensive. Compared to the technologies that we have already been through in the past, and as you mentioned, mechanization, that was probably our most capital-intensive investment in technology back in the fifties and the sixties. We do not see in these new technologies, biotechnologies and information technologies, those tremendously large capital investments that are necessary.

Many of these technologies we are talking about, you will be able to finance through your operating loan. You will not have to be seeking large capital in intermediate and long-term debt to be able to finance these technologies in the future.

Senator **Zorinsky**. Thank you, Senator Heflin.

I have a statement I would like to place in the record.[1]

Senator Melcher, have you a statement or any questions for the witnesses?

Senator **Melcher**. I have a few questions. I am sorry to be late, and I do not know which of you is which.

Dr. **Eddleman**. I am Dr. Eddleman.

Dr. **Richardson**. Richardson.

Dr. **Phillips**. Dr. Phillips.

Senator **Melcher**. Dr. Phillips, you show the possibility of a 2-percent-per-year annual increase in milk production between now and the year 2000. Is that based on milk production with the same amount of feed?

Dr. **Phillips**. It is basically based on technologies such as, for example, the bovine growth hormone, which is a technology that will allow you to increase milk production per cow from anywhere from 12 to 15 percent at a minimum, without additional feed intake.

Senator **Melcher**. Without additional feed?

Dr. **Phillips**. Without additional feed intake. That particular technology will allow increased production without having to increase the feed to the animal. You essentially must only cover the cost of the injections.

Senator **Melcher**. What is that based on?

Dr. **Phillips**. I'm sorry?

Senator **Melcher**. Is that theory?

Dr. **Phillips**. No, no. That is actual trial results, particularly done at Cornell University. Scientists will explain to you that it is essentially the redistribution of the nutrients within the cell which makes those cells much more efficient in the utilization of feed.

Senator **Melcher**. Well, the feed has been measured—are you telling me that?

Dr. **Phillips**. Yes, I am.

Senator **Melcher**. Is this gene manipulation?

Dr. **Phillips**. No. The bovine growth hormone is an injection; it is a hormone that is injected.

Senator **Melcher**. This is a hormone injection?

Dr. **Phillips**. The example I am giving you for dairy in particular is an injection. Gene insertion, which will essentially——

Senator **Melcher**. What animal has this been tried on?

Dr. **Phillips**. I do not know if I can give you the number, but it is basically research done at Cornell University with backing from Monsanto and Genotech, in which they set up trial experiments. As far as the scientific community is concerned, they are valid trial results.

Senator **Melcher**. I can accept them as valid trial results. I am just asking how broad is the trial.

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[1] See p. 223 for the prepared statement of Senator Zorinsky.

Dr. **Phillips**. Well, you will probably have to discuss that with the reproductive geneticists at Cornell or other universities. I do not have the specifics at hand. They are accepted within the scientific community.

Senator **Melcher**. Dr. Eddleman, were you the one that just said that increased production would come, but that the producers would be in the position of competing in world markets?

Dr. **Eddleman**. I am not sure I made that statement. I think that was Dr. Phillips.

Senator **Melcher**. Go ahead, Dr. Phillips.

Dr. **Phillips**. I am not sure I—the productivity increases?

Senator **Melcher**. Yes.

Dr. **Phillips**. Essentially, these productivity increases we discussed in our testimony and in the report are going to be necessary for this country as well as other countries to be able to meet the potential world demand out to the end of this century.

Senator **Melcher**. That brings up a different point, but let us pursue it for a moment. What is the world demand for cereals?

Dr. **Eddleman**. The basic tenet of this report and this study is that world demand is going to increase at a rate of about 1.8 percent per year from now out to the end of the century—1.5 of that percent will have to come from increased yields and new technologies.

Senator **Melcher**. Is demand balanced with supply now for cereals?

Dr. **Richardson**. That is very difficult to answer, because what we have to talk about is effective demand balanced with the supply that we have.

Senator **Melcher**. The "effective" meaning what?

Dr. **Richardson**. The willingness and ability to pay is considered in developing effective demand. There is a great deal of demand out there by people who cannot afford to buy it, and by that definition, demand is not balanced with supply. But if we look strictly at the effective demand, we have a greater supply than we have effective demand at this point, at reasonable and socially acceptable prices.

Senator **Melcher**. Then, the increased demand is an estimate?

Dr. **Richardson**. Yes, sir; it is an estimate based on expected normal growth in population. We can see a normal growth in population of 1 to 2 percent a year without any other benefit from increased wealth, et cetera. The 1.5 percent increase includes the normal increase in population.

Senator **Melcher**. Oh, I see, you are projecting an increased demand based solely on population?

Dr. **Richardson**. Yes, sir; 1 to 2 percent will cover the population.

Senator **Melcher**. All right. But then, Dr. Phillips, you used the word "competitive", in order for the U.S. producers to compete in the world market. Would you elaborate on that?

Dr. **Phillips**. It is just a recognition that many other countries are becoming more important in the international world markets in terms of being suppliers of many of these feed grains, cereal grains, that you have mentioned, and that we have no uniqueness or have no lock on these new technologies. They have access to these technologies, for the most part, also. They will be using them, and we will be using them to a great extent. And it is the fact that we need to adopt these new technologies to be competitive, because these are technologies that are basically going to allow us to produce more, with the same amount of inputs, possibly less, and to increase the yields that are necessary to meet the projected world demand.

Senator MELCHER. Well, in your terms of competitive are you saying that inputs meaning cost.

Dr. PHILLIPS. Yes.

Senator MELCHER. Are you saying that we cannot be cost-effective competitively?

Dr. PHILLIPS. If we do not adopt these new technologies, we cannot be competitive.

Senator MELCHER. Well, aren't we ahead on cost competitiveness now?

Dr. EDDLEMAN. No, sir; not on every commodity.

Senator MELCHER. On which ones are we not?

Dr. EDDLEMAN. Well, we are not on rice, that is for sure, with the Thailand situation. We have studied that, and they can produce at a farm-level cost about $100 per ton less than what we can anywhere in the United States. We are running into some of the same conditions with cotton and wheat. So we are not cost-effective with our own technologies in that respect.

Senator MELCHER. Where with wheat?

Dr. EDDLEMAN. In Canada and Argentina, for the most part.

Senator MELCHER. The Canadians refute that; every figure I have ever looked at bears that out.

Dr. EDDLEMAN. The Canadians have been able to stay right under whatever we set as our support prices to sell and compete in the market, so their cost—irrespective of what they are putting out—must be low enough for them to effectively follow this sort of export policy with their Canadian Wheat Board activities.

Senator MELCHER. They refuted that argument as of 2 years ago. I have not talked to them recently. I am not sure that there is any substance at all to your statement.

Naturally, there are some subsidies in Canada, and that is their privilege. But Canada has never maintained for itself that they can produce cheaper than we do; in fact, every figure I have ever looked at demonstrates that they cannot.

As far as Thailand goes I do not know what their capacity for rice is. I hear all the time, that they can produce it plentifully and cheaply. I tend to believe that they have pretty good yields, so maybe it is cheaper.

Dr. EDDLEMAN. I just spent 2 months in Thailand specifically studying the farm production sector. At the present time, Senator, they are producing rice at $105 to $115 per metric ton equivalent. I might say this includes the kitchen sink, so to speak in the production costs. It has full opportunity cost of family labor; it has a 20-percent profit built into their cost of production, which would be great if we could procure a 20-percent profit. We have also just completed a study in the Delta Region. In our region, just the cash production costs and machinery costs of producing rice is $200 per metric ton. So they have a cost advantage; I do not think there is any doubt. Now, their ability to continue to expand rice production, I think, is very much in question with regard to two things—one, the development and adoption of technology suitable to their producing region, and second, giving incentives to farmers to produce, because they are also only paying those farmers about $100 to $104 per metric ton for their rice.

Senator MELCHER. It may be that Thailand producers opt for a higher standard of living and when that happens, things change immediately.

I just want to make one final comment. I hold no expertise at all in the question of cost of production in Argentina on wheat. But I wonder why anybody would think it is necessarily very cheap down there right now, when the cost of money is 40 percent or 60 percent per year per annum. And I daresay that if that is figured into their cost basis, their input, they are not producing wheat cheaper than we are. They are just selling wheat cheaper than we are. We have a lot of examples of that all around the world. People will sell things cheaper than we do, even though they cost anywhere from 10 percent to 100 percent more in growth per unit. So I would not accept anything on Argentina unless somebody could pinpoint what the cost of money is. That is an input, and it is a pretty substantial input for our wheat growers. In fact, it is a substantial input for anybody in Argentina, because if money attracts 40- to 60-percent interest, you have to also figure that as if it were not put into growing wheat but what it would be worth if invested elsewhere.

Dr. EDDLEMAN. You have certainly got a very good point there, because you are looking at all the macroeconomic factors that are involved, not just the technology. We feel that the technology levels are such in many of these regions that, apart from the inflation that they are hearing and what-have-you, they are competitive from that technology standpoint.

Senator MELCHER. Any country that wants to subsidize their exports can undersell us. Based on our costs; I agree with that. But I have not found any country that can compete with us on the same cost basis—and that does include Canada, and several years ago, it did include Argentina. I have nothing to update that on with Canada, except 2 or 3 years ago, when they were looking at their own estimates. In the case of Argentina it has been 4 or 5 years since I looked at. I am not going to hazard a guess on it now, but I question whether Argentina's condition on wheat has been properly presented on cost input.

The CHAIRMAN. Thank you very much, gentlemen. We have another panel. I do have some more questions, and if I could impose on you, and maybe other Senators would want to do the same thing with questions that come to mind, would it be all right if we submitted some questions in writing, and you can respond to them, so we can make those points a part of the record, as well.

Thank you very much again for being here and for going to so much trouble to prepare your testimoy.

[The following was received for the record:]

WRITTEN QUESTIONS FROM SENATOR LEAHY AND OTA'S RESPONSES

Question 1. Have we any idea as to when the bovine growth hormone will be approved and released?

Answer. According to Dr. Howard A. Schneiderman, Senior Vice President for Research and Development, Monsanto Corporation the bovine growth hormone should be approved by FDA and on the market by 1988.

Question 2. In all the research involving this new technology has any attention been focused on the impact of increased production accompanying the introduction of the hormone on the local economy?

Answer. No. The OTA report *Technology, Public Policy, and the Changing Structure of American Agriculture: A Special Report for the 1985 Farm Bill* is the first study to analyze the effects of new technologies (including the bovine growth hormone) and public policy on the dairy industry. The second report from this study will include an analysis of the impact of these technologies on rural communities by region (including the Northeast), the environment and natural resource base.

Question 3. Has anyone focused on the kinds of strategies which will help our dairy community adopt and adjust to this new technology?

Answer. The OTA report begins to address this question. It analyzes alternative dairy policies and indicates which policies are favorable or unfavorable to various sizes of dairy farms in different regions of the country. It also indicates the research and extension policy needed for moderate size farms to compete with these new technologies in the future.

Question 4. Has anyone looked at the kinds of problems we may anticipate in association with the dislocation from dairy farming that will be likely to accompany the introduction of the hormone?

Answer. No. The final report from the OTA study will begin to address this concern for dairy and other agricultural commodities.

The **CHAIRMAN**. Our next panel will consist of Dr. Clive Donoho, Jr., who is director, Georgia Agriculture Experiment Station, in Athens, GA; Dr. Geoffrey Benson, extension economist, Dairy Management and Marketing, Department of Economics and Business, North Carolina State University in Raleigh, and Dr. Larry F. Huggins, head of the department of agricultural engineering at Purdue, West Lafayette, IN.

Gentlemen, thank you very much.

How was the weather in Raleigh when you left? Somebody told me it was 80 degrees there Sunday.

Dr. **BENSON**. Not quite.

The **CHAIRMAN**. As you know in the case of your prepared statements, your statements will be printed in the record in full. You may summarize, and that leaves more time for questions. You may proceed as you wish, in the order named.

Thank you very much.

STATEMENT OF DR. CLIVE W. DONOHO, JR., DIRECTOR, GEORGIA AGRICULTURE EXPERIMENT STATION, UNIVERSITY OF GEORGIA, ATHENS, GA

Dr. **DONOHO**. Thank you, Mr. Chairman.

I very much appreciate the opportunity to make a very few comments to the committee this morning. I will be brief in my opening statement and then rely on the committee to respond in questions, if they wish.[1]

The point I would like to make is that the State agriculture experiment stations have been involved in the research business or technology development now for over 100 years in this country. We think it has been a major force in moving agriculture in terms of scientific development at the stage it is today.

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[1] See p. 236 for the prepared statment of Dr. Donoho.

Some, as you will note from the previous discussions, have suggested that research is a major cause of present day surpluses and overproduction. I do not really believe that. While the new technology development may well have provided the agricultural production system to allow this to happen, the reasons for these problems are far more policy-oriented than they are technology-oriented. A substantial reduction in technology development for agriculture, in my opinion, would have devastating effects upon the competitiveness of the U.S. farmer and of U.S. agriculture.

In fact, no segment of the U.S. economy can rest upon the technology of yesteryear and expect to compete successfully. The need for new technology development in agriculture has never been greater, and in my opinion, the stake is nothing less than the U.S. competitive edge in the world agricultural economy.

I could go, Mr. Chairman, into a number of specific research technologies that we see the future, but I think I will rely on the committee to ask those questions that they are specifically interested in, and I will try my best to respond and let the written record stand in terms of our testimony today.

The CHAIRMAN. Thank you very much, Dr. Donoho.

Dr. Benson.

Dr. BENSON. Again, Mr. Chairman, I welcome the opportunity to be here, and I appreciate the honor.

Following the preceding speaker here, perhaps I can just refer you to a graph on page 8 of my written testimony.[1]

The CHAIRMAN. All right, page 8.

STATEMENT OF DR. GEOFFREY A. BENSON, EXTENSION ECONOMIST, DAIRY MANAGEMENT AND MARKETING, NORTH CAROLINA STATE UNIVERSITY, RALEIGH, NC

Dr. BENSON. Much was said in the first panel on the dairy situation. This graph here tries to document some of the dramatic changes that have occurred in the dairy industry, as was pointed out, and probably will continue. Some of the major trends that have occurred, say, over the last 20 years to 30 years; the solid line shows production per cow, going from the bottom left to the top right, has in fact increased at somewhere between 2 and 3 percent annually over this last 20- to 30-year period. So the sorts of projections we heard earlier have already been experienced in the past.

The dairy economy, as you know, is a fairly closed economy. Imports are restricted by quotas; dairy products are not competitive with either low-cost products from New Zealand or subsidized exports from the European Community. And demand for dairy products, although it has trended upward since about 1970, has increased very slowly, less than 1 percent per year. So this increased productivity per cow in a sense has backfired on the dairy industry. And if you look at the line reflecting the number of cows and also the number of farms with 10 or more dairy cows, you can see a marked decline in both the number of cows and farms. In fact, more cows went to McDonald's to offset the increases in production per cow on an annual basis—at least, up until 1979 when there was a turnaround, and of course, the current policy problems stem from that increase in cow numbers at that time. The number of dairy farms has declined even more rapidly than the number of cows, in part because of labor-saving technology on the farm; milking parlors, housing, feeding, manure handling, bulk milk collections. So indeed, the family farm has gotten larger, and family members can now handle considerably more cows than they could 20 or 30 years ago. But in a sense again, that is reflected in the number of dairy farms.

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[1] See p. 238 for the prepared statement of Dr. Benson.

Now, I would expect in general these long-term trends to continue, because the same factors that have been at work are likely to continue into the future.

I think I will end my comments there and see if there are questions that arise from this.

The CHAIRMAN. Very well.

Dr. Huggins?

STATEMENT OF DR. LARRY F. HUGGINS, HEAD, AGRICULTURAL ENGINEERING DEPARTMENT, PURDUE UNIVERSITY, LAFAYETTE, IN

Dr. HUGGINS. Thank you for the opportunity to be here.

First, I would like to commend this committee for their basic approach of trying to develop a new, long-range, economically sound strategy for agriculture in its broadest content.[1] I believe your new legislation should be based on developing policies that will be applicable to all of the many industries that serve to provide the processing and delivery of food and forest-based products in the country, rather than only the farming segment that provides its essential foundation.

I think an underlying premise of our agricultural policy should be to encourage industries to retain and develop a position of international competitive leadership. I believe that we have the capability to do that, and I think that an understanding of the opportunities that new technologies and research have to contribute to that goal is critically important to developing sound and farsighted legislation.

What are some of the technologies, then, that I think offer the greatest potential? There is always a risk, because of the broad spectrum of agricultural industries, in developing any very short list that you are going to exclude some particular areas, but I think three merit special attention and consideration. No. 1, computers and advanced sensor technology; No. 2, the biotechnology and biochemical processing areas; No. 3, artificial intelligence, as it applies to agricultural production and management. These are areas that will affect all of the fields of agriculture, food, and wood utilization industries in this country.

How can these technologies favorably impact agriculture? As was pointed out earlier in Senator Heflin's questioning, I think one of the primary needs in agriculture today is to improve the profit opportunities of its farming sector. Achieving that goal in a way that is economically sound and will contribute to the entire population's standard of living, I believe requires emphasis of new technology in three ways: One, reducing production costs—I was particularly encouraged to see the questions raised in that area; two, improving the quality of the product that we produce and deliver to the marketplace; and three, developing new uses for our basic commodities.

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[1] See p. 244 for the prepared statement of Dr. Huggins.

Let me try to highlight very briefly some of the ways in which I believe computers, biochemical processing, and artificial intelligence each can and will positively affect agriculture in the immediate future.

I believe that computers and sensor technology will primarily affect agriculture in what I would call a not-visible presence. It is not going to be the personal computer that we see moving onto today's farm and being used primarily in an accounting way, which is the natural first step; but rather, it is going to be the use of imbedded microprocessors and sensors to develop fundamentally new and more capable machines and monitoring systems. Such systems will lower production costs by making feasible more individualized and adaptive production of plants and animals. This personalized adaptability will not only enhance production efficiency, but will also improve the product quality, reduce risk of production, and enable more environmentally compatible production systems. The comprehensive process data they will be collecting will enable greatly improved management decisionmaking.

Let me give two particular examples that I think will occur fairly soon. The first is related to the application of herbicides and pesticides. The use of vision-controlled systems to more carefully and precisely control application will reduce the cost of chemicals, improve effectiveness of application and also result in enhanced environmental compatibility by limiting unneeded application areas. Second, the use of sensors and microprocessors to automate the collection of data will reduce financial risk by providing early disease and pest detection and by offering information—based decisionmaking support systems to improve the management on our Nation's farms and its processing industries.

Let us consider the biotechnology and biochemical processing area. Much of the opportunity for future profitability enhancement involves, in my opinion, value-added, postharvest processing of our basic commodities. These opportunities will often yield improved product quality and involve the use of farm-produced biomass as the raw material for a new product. In addition to biotechnology, our expanding knowledge of basic biological systems is now giving the capability to create new biological processes to use biomass and convert them into high-value product. Current examples of trends in that area involve such things as sweeteners from corn, ethanol from corn to be used as nonleaded octane booster, and vegetable oils for nonfood uses including coatings, lubricants, and plasticizers.

The third area identified is artificial intelligence. This is going to be the glue that binds together the parts from the others and allows us to develop more effective and sophisticated control systems and machines. Agriculture is going to apply subdisciplines of artificial intelligence as imagine-processing and pattern recognition to create entirely new machines and mechanisms for improved production, reduced production costs, and better product quality. The emerging area of expert systems and knowledge-based decision support systems is going to greatly enhance the precision and profitability of future management.

Let me say in conclusion that I think meeting the challenge and maintaining the world's leading agricultural process and delivery system will require a complex set of inputs. There is no single solution that is the cure-all. We must have a sound and a farsighted set of Government policies that stimulate our agricultural industries to maintain a competitive edge.

We have, in my judgment, the natural resource base, the educated people base and the infrastructure in our agriculture to advantageously utilize the most sophisticated science and engineering advances that are on our horizon. The challenge is to stimulate continued development and to encourage adoption on an economically sound schedule. This requires a long-range perspective and clear goals that I am hopeful that this committee will integrate into the next agriculture bill.

The CHAIRMAN. Thank you very much, Dr. Huggins.

I suggest we set the clock—we have four Senators here—for 8-minute rounds, and then we will see if anybody wants to add further questions.

Do you think that the dairy farmers generally understand what needs to be done?

Dr. BENSON. That is a very difficult question, and I am not quite sure how to answer it. I think from my perspective, working with dairy farmers in North Carolina, that they do not see the total picture in the industry. They are very much concerned with their individual businesses and paying their individual bills, and perhaps do not perceive the sorts of changes going on in the industry and the realities which they have to face if they wish to remain in the business.

The CHAIRMAN. Do you agree with that?

Dr. DONOHO. Yes, I do, Senator Helms. In relation to the dairy question or problem, I think that there is one area that we are overlooking in terms of the future with the dairy industry. We are assuming that the only product coming out of the dairy industry is milk and milk products. That may not be 10 or 15 years from now. The dairy cow is a wonderful manufacturing tool that we have available to us, and there is no reason that, through some of the biotechnology research that is going on today, we will not have the technology to turn that cow on to producing other products other than milk. These may be very high-value pharmochemicals, or chemicals that today are extremely expensive to produce and laborious to produce for the society of this country, but the dairy cow may be very well able to manufacture those as a normal biological process, and I think we have to consider that in terms of the technology that we are developing today.

The CHAIRMAN. The OTA report concluded that milk production can be expected to continue to increase in the lower regions of the Southeast and the Southwest. You are nodding your head, so I assume you agree with that.

Dr. BENSON. Yes, I believe I do. We have seen some tremendous increases in production in the Sun Belt States in general, running from the Atlantic to the Pacific, in large measure to supply the growing populations there with fluid milk and other products.

The CHAIRMAN. If Congress were to adopt either a national two-price system or a new dairy diversion program, would we effectively be able to stop this trend?

Dr. BENSON. I have not had the opportunity to either visit with Dr. Richardson or read the report, and I am not very familiar with the basis for those projections. I think Congress can do some things, depending on the policies adopted, to modify where changes will occur. I do not have right now any suggestions as to the nature or magnitude of those changes, however.

The CHAIRMAN. Do either of the other two gentlemen have any thoughts on that?

Dr. HUGGINS. Not at all.

Dr. DONOHO. No.

The CHAIRMAN. I have just come from another meeting of an industry in trouble, the textile industry, which is vital to our State. The rotunda downstairs was filled with people interested in that issue. We have lost in North Carolina alone in the past couple of years, 200 plants, some 40,000 to 50,000 employees, and this is going on throughout the country.

I guess what we are talking about are market forces. Suppose Congress should decide to try to stand in the way of market forces. Do you think we could successfully do it.

Dr. BENSON. I am not sure that that is possible. I think Congress can modify those effects, however. One suggestion Dr. Phillips made was recognizing the structural changes that may be inevitable and perhaps providing some assistance to make the transitions a little more tolerable for those involved.

The CHAIRMAN. But not stand in the way of it.

Dr. BENSON. I do not think that is possible.

Dr. HUGGINS. I think only temporarily. I think all of these areas must be globally competitive. We do have the capability and the capacity within our country to operate in a competitive environment and to produce these items from a position of leadership in the world.

Dr. DONOHO. Senator Helms, I guess the thing I would say is that so often, I think that we tend to send the world the wrong signal in terms of our policy development. What I mean by that is when we send the signal that we are going to drastically cut back production, assuming that we are dealing with a U.S. market alone and that we can impact that market to increase prices of our products produced in this country, all that does is send a signal to other producers around the world, especially those countries that want to subsidize their agriculture, that my, what an increased world market we can face now, because we will be able to undersell the U.S. market. I think whatever we do in terms of writing legislation, we have got to deal with that subject as to how best not to send the wrong signal to the rest of the world in terms of being our competition.

The other example I would give you—something was said earlier this morning about Argentina. I do not know if all of you followed the history of agriculture in Argentina, but back probably 15 to 20 years ago, Argentina was a major exporter in the world market. In fact, they exported approximately 25 percent of the wheat, 65 percent of the maize, and nearly 38 percent of the beef in the world market. Today, that is down to less than 10 percent. The example I am giving you is the impact of a national policy on agriculture in a country.

That impact was through a taxation of exports out of Argentina. And the quote that was recently given by the Minister of Agriculture in that country indicates that "we are now paying for the past downgrading of agriculture in our Nation—and never again will we turn our back on the land." That is a powerful message for this country.

The CHAIRMAN. We certainly have the anomaly in other parts of the world of having promoted production, helped and assisted, and all very well. Now we are trying to struggle with what we have created. We were talking about if we wanted to, if we could resist market forces. That reminds me of a Governor of North Carolina, some years ago, we were having more hurricanes than we are having now—thank the Lord—he would get on his yellow slicker and his yellow hat and go down to the ocean for the purpose of having his picture taken——

Senator LEAHY. He was probably the last Governor ever to do a thing like that.

The CHAIRMAN. No, I expect it is still being done. But somebody said he went down there to blow back. But it is just not going to work.

What is the estimate of the number of dairy cows in the United States today? I do not even know.

Dr. BENSON. It is 10.8 million.

The CHAIRMAN. If you had a time machine and could crank a card to, say, 1990, where would it be?

Dr. BENSON. Well, again, depending, if the adjustments that have happened in the past continued, then we are talking about a 1 to 2 percent decline in the number of cows annually, if that is the mechanism used to balance increased productivity per cow with what seem to be reasonable estimates of sales, which I think is still in the range of less than 1 percent annually.

The CHAIRMAN. All right.

Senator Leahy.

Senator LEAHY. Thank you, Mr. Chairman. I have a statement I would like to make a part of the record.[1]

The CHAIRMAN. Without objection.

Senator LEAHY. Mr. Chairman, I would like to follow up on a question that you asked.

We had a dairy hearing in Vermont yesterday, of a subcommittee of this committee.

Incidentally, Mr. Chairman, I thank you and express my appreciation to you, for authorizing the hearing. Also, I was asked to express the appreciation of the Governor and others in attendance for the hearing in Vermont.

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[1] See p. 223 for the prepared statement of Senator Leahy.

I am wondering about this bovine growth hormone. I raised that with a couple of people up there and heard a variety of answers. I have heard all kinds of statements about it. I somehow get this impression that New England might end up with one huge cow. [Laughter.]

You talk about your hurricanes, Jesse. This growth hormone is apparently going to have an incredible impact in terms of my State. Do you have any idea when the dairy hormone is going to be released or produced?

Dr. BENSON. Yes, I know what you mean. I checked with the head of our animal science department, and there are several stages yet to be gone through before it would be a practical proposition on the farm, including licensing by FDA. But at the present time, what has been documented is the reaction of the cow to the hormone under research conditions. I think we are quite a long way from having an onfarm practical application at this stage. I think there are several avenues being pursued simultaneously, including oral ingestion, implants, and things of that nature.

Senator LEAHY. Will we see more and more of the development of supercows, whether through this hormone or just through genetic engineering?

Dr. BENSON. Yes.

Senator LEAHY. Doing a study about what effect agricultural technology may have on, say, the dairy industry as a whole would be useful. We are cutting program provisions to limit production, increase consumption, and working to avoid throwing everybody off their farms overnight. If we begin producing a lot more milk with far fewer cows, and we are trying to keep the number of farms about even, we seem to be facing a dilemma.

Is USDA doing studies of the possible effects of the growth hormone?

Dr. BENSON. I am not sure what studies are being or are done. The previous panel may be able to speak to that, since they have recently investigated the area.

I think maybe you were not here when I showed my picture. It is from those long-term trends, and if they are likely to continue, two things can be drawn—that past policies have not retarded the adoption of this technology, and they may have slowed, but certainly have not reversed this trend to fewer cows and fewer farm numbers. At the present time there are two problems—the short term problem, that we have gotten off this long term trend, in other words, the number of cows increased, the rate of exit from the industry slowed, close to nil. So the real question is, if a market orientation is desired, there will be a lot of distress amongst dairy farmers until this what might euphemistically be called excess capacity or too many cows and too many dairy farmers relative to current consumption--until that adjustment is made. Then in the longer term, there is the question of what policy is desired and how can it be implemented to avoid a recurrence of current problems. So I think there is a short term and a long term dimension here.

Senator LEAHY. Mr. Chairman, if I might, I would like to ask some questions of USDA concerning that long-range impact. Obviously, I do not think that anything would happen this year to make that much of a change in the long-term dairy situation—maybe it might—but at least we ought to be looking at possible effects.

The **CHAIRMAN**. It would be very helpful, and these gentlemen have agreed to respond to written questions because the time for oral questions is rather limited.

Senator **LEAHY**. Thank you.

The **CHAIRMAN**. Thank you very much.

Senator McConnell, you are down there near Alexandria somewhere. Don't you feel lonely down there at the end of the table? Come on up here.

Senator **McCONNELL**. I am sort of used to it, Mr. Chairman.

I just want to say how pleased I am to be a member of the committee, Mr. CHAIRMAN. I have no opening statement to make, other than to commend you for holding these hearings. It is a good time to be on the Agriculture Committee, as we consider how we restructure all of our commodity programs for the coming years.

So, I am glad to be here. Thank you.

The **CHAIRMAN**. Thank you very much.

Senator Melcher.

Senator **MELCHER**. Thank you, Mr. Chairman.

I want to say to the three of you that it is like the combination of homecoming and old home week—are you all land-grant colleges?

Dr. **DONOHO**. Yes.

Dr. **BENSON**. Yes.

Dr. **HUGGINS**. Yes.

Senator **MELCHER**. I do not suspect there is anybody on this committee that doesn't agree with you very whole heartedly. I certainly do. However, I am also one who likes to see a lot of production, and that, of course, gets us into the problem of surpluses.

Dr. Donoho, you made my day when you mentioned your fifth major point there on page 3, Research on marketing, utilization of policy, increase of sales of agricultural products in both domestic and foreign markets.

I suspect that the biggest thing lacking in our land-grant colleges today is research and market development, particularly abroad. Judging from what I have heard from this committee over the past 2 to 4 years, we want to expand markets abroad. Perhaps we are not ahead of the farmer, believe me, but we may be ahead of a lot of other people in Government. We see that as the only true solution to American agriculture's pricing problems now. We can go several different routes, of course, in exporting. We can attempt to do so by reciprocal agreements, which I personally advocate, or we can go subsidy, as so many other countries have and compete that way. We should do one of these, or take a combination of these as well as utilizing our food donations and cheap food sales through terms and credits. Still, I suspect out of all of this that our only handicap is just lack of determined effort to force it by legislation, and I hope we do so with this particular bill.

I wonder if you all agree that what is lacking in land-grant colleges now is a more determined policy of looking at expanding markets, particularly in exports. Is that true, or am I jumping to a conclusion I shouldn't be?

Dr. DONOHO. Senator Melcher, I would say that all of the major land-grant universities that I am aware of have a component of marketing and policy in them, as part of the Agricultural Experiment Stations.

Senator MELCHER. Foreign marketing?

Dr. DONOHO. A major thrust of that effort in the past has been very State oriented. We have assumed that the national ERS economists are in a good position to help with the writing of national policy. I guess in terms of my own philosophy, I have become convinced in the last 2- or 3-year period that unless our land-grant universities get serious about policy for this Nation, we are going to continue with many of the same problems that we have had over the last 10-year period.

Senator MELCHER. I am glad to hear you say that, and I would encourage you to pursue that, with all diligence because it is entirely true. The land-grant colleges are not in the lead. The Department of Agriculture simply is not taking the lead. People in agriculture are much ahead of the Department in this respect, and I would encourage the land-grant colleges to be right up in the forefront, also.

There is one point I would like to make with you, Dr. Benson. I had a delightful visit with one of the cardiologists—they are certainly in the minority among cardiologists—but one of the leading cardiologists who represents that minority view that dairy products are extremely beneficial for heart patients, particularly high blood pressure. Perhaps, after a prolonged discussion among the cardiologists, we will have a chance to see whether indeed that is true. If it is true, I suspect that the consumption of dairy products in the United States would climb very rapidly.

Dr. BENSON. Well, yes. If you look at the trends, unfortunately, total commercial sales trended downward until about 1970 or 1971. This is not shown on the graph. And only since 1970 or 1969 have total sales increased. We still have a problem with declining per capita consumption in most products except cheese. Hopefully, the recent nutrition research, negating some of the adverse publicity on cholesterol, but also the effect of dietary calcium on the health of the older female population particularly will help sales.

Unfortunately, the one area that concerns most people, I think, in the dairy industry, is the cost of vegetable oils and vegetable proteins relative to milk fat and milk protein. We have seen what happened to the butter market with the advent of inexpensive margarines. We have seen what has happened in the mozzarella cheese market, where the imitation product is virtually indistinguishable from the real thing when it is on top of a pizza. I imagine there is a real possibility of advances in artificial or imitation cheese technology. Given those widespreads in the raw material costs, that gives a tremendous economic incentive to food technologists to come up with a less expensive substitute, I am afraid. That is the major cloud on the sales side, I am afraid.

Senator MELCHER. Thank you. I should mention that this particular cardiologist—and maybe it is true of the group of cardiologists that agree with him on his research data—also mentioned that salt intake would be important with the higher consumption of dairy products.

My time is up, Dr. Huggins, but I just want to compliment you on including wood products as part of the agricultural spectrum. I think we always seem to put that last, and a lot of people forget it entirely as being part of agriculture. Thank you for expressing that.

Senator **Leahy**. Senator Heflin?

Senator **Heflin**. Dr. Huggins, I had to unfortunately—or fortunately, depending on how you look at it—I had to leave to go to another matter, but unfortunately, here, I did not hear all of the testimony, but I am told by staff that you made some statements relative to the direction of research that are not contained in your statement. I wonder if you would repeat those again for my benefit.

Dr. **Huggins**. Well, Senator Heflin, I appreciated your earlier remarks to the first panel about the importance of reducing the cost of production as an area that we need to emphasize. I certainly concur with that, and am of the very firm opinion that many of the new kinds of technologies that we are looking at, particularly from an engineering perspective, are very directly related to reducing the cost of production and enhancing the quality of the resultant product. The other areas that relate to total production increase also do contribute to lower unit cost. But beyond that, I believe there is a major role to be played and a major opportunity to continue to strive toward reduced production cost that gives us the opportunity to maintain that position of competitive leadership within world markets, and gives the consumer high-quality products at a cost that they can afford.

So I believe there are many mutual benefits in moving in that direction and emphasizing reduced production costs. I certainly would welcome any kind of increased stress on that in the future, as you suggested in your earlier remarks.

Senator **Heflin**. Do you have some specific areas that you could mention that you feel that there is potential in?

Dr. **Huggins**. With the additional sophistication of controls and monitoring that are well within our technological capability, if we can get the people power to design new systems, there are many opportunities. One can reduce the costs of storage and processing of our basic grains, for example, by going to lower temperature drying techniques to process the product as it comes out of the field; the lower temperature approach has both cost benefits and energy use reduction benefits, as well as product quality enhancement. That drying approach has not been practical to date on a farm scale simply because of the lack of monitoring and sophisticated control mechanisms that prevent spoilage. So the tendency has been to reduce spoilage risk to an acceptable level by quickly drying the material so that we do not have to worry about the formation of molds and other kinds of spoilage.

Increased monitoring sophistication opens up all kinds of new possibilities. We can look in terms of grain production at new kinds of control and monitoring mechanisms on farm machinery that automatically adjust to variable conditions as one moves across the field in terms of plant populations, in terms of the applications of fertilizers, to once again reduce the cost of producing a unit of product and restore a profitable condition to the farmer.

Examples that have been demonstrated at Kansas State, for example, are new and automatically adjustable transmissions, so that you optimize performance of the machine as it moves across the field to lower fuel consumption. Their field studies show operational cost reductions ranging anywhere from 0 to almost 40 percent, depending upon the terrain and the variability of conditions.

We at Purdue have been doing work relative to new and sophisticated controls on combines, once again to adjust to the variability of conditions that occur on the field, to reduce losses from the machine, to reduce breakage and damage that occur to the grain as you encounter different moisture conditions through the field. And there is a whole host of capabilities that are now technologically feasible as we begin utilizing the newer kinds of microprocessor and sensor technologies that are within affordable and economical ranges.

Senator HEFLIN. I would like to address this to the panel as a whole. I do not have the exact figures here, on the proposed budget of the OMB, but it is my understanding that it would reduce research that we have from Government about 15 percent. It would reduce the Extension Service by about 25 percent. It would abolish the Soil Conservation Service. If these cuts take place, what effect do you consider it will have on basic research in agriculture in the land-grant colleges as far as research?

Dr. DONOHO. I will take the first shot at that, Senator. If you will look at the written testimony on the last page, there are two facts that are there. One is that the President in the executive budget recommends an approximately 13 to 15 percent cut, as you have indicated. In my opinion, this will have a very direct effect in terms of the research that is accomplished, in terms of cost of production and the productivity of U.S. agriculture, and could have serious impacts upon what we have talked about earlier in terms of this Nation being able to compete. That impact would probably hit us 5 to 10 years from now.

The second point I would simply make is that research is a continuing long-term activity. The research we have that is coming out today, that is being used today, probably came out of the minds of the scientists 10 years ago. It is just now beginning to hit our production and technology systems.

The research ideas that are coming out of our laboratories and field research programs today will probably impact 5, 10, or 15 years from now in terms of this Nation's agriculture.

So, in my opinion, it would have a drastic effect upon our ability to continue with the technology development and be competitive in world agriculture, as we are today.

Dr. BENSON. Perhaps I could add two things to that, and I think, Mr. Chairman, you touched on these at the outset. The first is that the rates of return that have been estimated on research and extension activities are very high, very positive, looking at it from a total social point of view. We have not mentioned, perhaps, adequately the large benefits that consumers have had as a result of these research and extension activities in the past. Mr. Chairman, you noted the very small percentage of disposable income currently spent on food, and therefore, from a total, social point of view, it seems to be a very undesirable state of affairs to reduce these expenditures. But again, as Dr. Donoho says, the result can be quite a long time in surfacing, but then, I think, would overshadow the current problems.

In one regard, it is rather nice to have problems of over-abundance, perhaps, rather than of scarcity.

Dr. HUGGINS. Let me just make two comments. I think as you reflect and develop the new agriculture bill you must be very cautious of adopting short-range benefit kinds of strategies that result in long-range catastrophes. I perceive the reduction in research and development to be an example of that type.

I would like to see us adopt an attitude which asks for accountability in return on investment for research. I believe that you in the Congress and the American people have every right to expect a high return on their investment of public dollars. I believe there are several studies that have evaluated public returns of agricultural research investment. While I make no claims that examples cannot be cited in which we have undertaken projects that have not delivered a good return on investment, some of that is the very nature of research. If one is going to get into new areas you are going to have to stretch your imagination and take risks. I believe that we must continue strong public research and technology transfer support. I believe careful analysis will substantiate a very high return on that investment. I hope this Congress in their wisdom evaluates the need for such funding on that basis, and makes a decision for strong support.

The CHAIRMAN. I believe Senator McConnell is going to reconsider. He passed last time. Do you have some questions now?

Senator MCCONNELL. Thank you, Mr. Chairman.

Dr. Donoho, I was not here during your testimony, but I am told that it appeared from what you had to say that technological advances would directly benefit large-income farmers. I think it is awfully important that research programs, both private and public, address the needs of farmers with gross farm sales of $40,000 to $100,000. These farmers, as you well know, are in a situation where they are unable to obtain off-farm income, because of significant onfarm management responsibilities. And I wonder what impact these future technological advances are going to have on this category of family farm, and if in fact, it is going to become increasingly difficult for those people to make a living in farming; are we really talking about entirely restructuring agriculture in America?

Dr. DONOHO. Senator, I think my written testimony reflected that in the area of mechanization, robotics, traditionally mechanization, I think, has assisted the larger farmers more than the moderate or smaller farmers simply because the resources have been there to take advantage of that mechanization. There are many, many areas of research and technology development that are size-neutral, and that are just as important to the small farmers and to the moderate-size farmer as it is the larger farmer. In fact, I suspect that we would have already seen a shift larger than has occurred if the research had not been done in terms of things that assist the small farmer and the moderate-size farmers as well as the large farmers.

I would also say that areas of research of environmental concern are certainly important to note only the farming structure of this country, but to all citizens. There is a lot of research in that area. Acid rain, the experiment stations have taken a leadership role in assessing the impact of acid rain on agricultural production in this country, and that has been going on at least 5 years before it became a national issue. Areas of technology development that will develop a new variety that is resistant to pests, to insects, and disease, I am sure would have to be as important to the moderate-size farmer as it would be the large farmer in terms of these input costs to that farmer, regardless of farm size.

So I am coming out, I guess, and telling you that I think there are certain areas of technology development that, by the nature of the ability of the farmers to purchase those inputs, are probably more an advantage to the larger farmer than to the moderate or small. But there are many other areas of technology development that we think are size-neutral. In fact, I would say about 85 percent of our total research effort, I would classify as being size-neutral in terms of benefits to the farmer.

Senator McConnell. So in your judgment, the farmers in the category that I outlined do have a place in the future; they are going to be able to compete, in your judgment?

Dr. Donoho. I think, in my own opinion, that they certainly have a place in our agricultural system in this country. The real benefits to this Nation in terms of our family farmers being willing to work that 7 days a week and 15 to 18 hours a day when necessary and put all of the labor inputs themselves into that farming operation, has accounted for an awful lot with the technology development they have been able to use to the kind of agriculture we have in this country.

A lot of the corporate farms that we read about today are family farms. They have incorporated because of tax structures, they have incorporated for many reasons in terms of their size development, but they are still family-operated and family farm, and I think we get confused on that sometimes, although those large farms, there is no question that they have many advantages in terms of dealing with the economy.

Senator McConnell. That is why I did not define it as a family farm. I simply chose to define it in terms of gross sales.

Dr. Donoho. Fine. I guess that would be my answer to you, sir.

Senator McConnell. So there is a place for the $40,000 to $100,000 farmer?

Dr. Donoho. Absolutely. And I think the specialty crops, the high-labor-intensive crops that this Nation still needs, the fruit and the vegetables and many of the ornamental crops, extremely high value crops per acre, if you are looking at it on that basis, the moderate and small farmer can be very effective producers of those crops, and this Nation needs them.

Senator McConnell. Thank you, Mr. Chairman.

The Chairman. Let me ask one question. I have got to leave here in a minute; I have a command performance. The President is coming over to have lunch with some of us.

Soybeans in our State are very important, as you know. About 30 years ago, they were just a cover crop. New technologies have made it one of our leading cash crops. I visited with some soybean farmers just the other day.

Now, my question is, Do you gentlemen foresee these types of changes on the horizon for any of today's so-called minor use crops? I am thinking of sunflowers and things of that sort.

Dr. DONOHO. Senator Helms, I guess I would answer that that will depend a great deal upon the marketplace and also upon the utilization kinds of research that we do over the next decade. Soybeans have become a major crop in this country because of the utilization research that was done to show the many uses of that crop other than as an animal feed or as a nitrogen-producing crop in a rotation system. So I think the possibility is there, with the new technology and the new biotechnology research that is going on, to produce new kinds of crops than we have traditionally produced in this country, as long as we can aim them for specific markets.

The CHAIRMAN. Well, I guess what I am getting at, is there a spin-off between the support prices for I guess what you would call historically grown crops like wheat, for example. Would that have any effect on the enhancement of the so-called minor use crops, or would it depend on the technology?

Dr. DONOHO. I think the need for the minor crops grown in this country will continue. Obviously, most of us just do not want to eat bread and meat in terms of a diet. So we have got to continue to produce those minor crops in large capacity in this country, and we have got to have the technology to do it. The world market comes into play on this one, because if you know what has happened to the canning tomato industry of this country, you know that there was an attempt about 3 years ago to reduce the production of processing tomatoes below the national consumption. Theoretically, this should have increased prices, but the fact was that because of the subsidy and the trade policies that we have, Italy imported processed tomatoes into this country, and the ports already partially processed at the price that our farmers were getting for their crops.

All I am saying is that we have to have a technology on the specialty crops as much as we do for the major commodities that we are discussing today.

Dr. BENSON. If I could just add a comment to that, I think indeed, the price support and the farm policies in general have tended to favor the crops that are covered, in two regards—that the price or income to be earned has been somewhat enhanced, and perhaps just as important, the risks of production are reduced, because the policies tend to shield from risk. So I would say that the production of traditional commodities has been enhanced because of the existence of the programs.

The CHAIRMAN. Gentlemen, thank you very much.

Senator MELCHER. Mr. Chairman, I would just like to make one comment before these gentlemen leave. I grew up holding research and development in some sort of awe. I have not lost that, and I do not think Congress has. I do not think this Congress is going to be able to continue having $38 billion in research and development for the Defense Department and let research and development in agriculture go down the tubes. I well realize that when you break up research projects, it takes years to reassemble and get back on track. What you started 10 years ago begins to pay off this year. I hold to that, and know that research and development, once decimated, is not recovered quickly.

Dr. **Huggins**. I thank the Senator for your support.

The **Chairman**. Thank you very much, and again, we are grateful for your coming here today and your preparation. If you do not mind, we will file some questions which we would like to have you respond to.

We stand in recess.

[Whereupon, at 12:05 p.m., the committee recessed, to reconvene at 10 a.m., Wednesday, March 20, 1985, in room 328-A, Russell Senate Office Building.]

FRAMEWORK AND ANALYSIS FOR AGRICULTURAL POLICY IN 1985

Capital Investment, Debt, Credit, and Taxes

WEDNESDAY, MARCH 20, 1985

U.S. SENATE,
COMMITTEE ON AGRICULTURE, NUTRITION, AND FORESTRY,
Washington, DC.

The committee met, pursuant to notice, at 10 a.m., in room 328-A, Russell Senate Office Building, Hon. Jesse Helms (chairman of the committee) presiding.

Present: Senators Helms, McConnell, Zorinsky, Melcher, and Dixon.

STATEMENT OF HON. JESSE HELMS, A U.S. SENATOR FROM NORTH CAROLINA

The CHAIRMAN. The meeting will come to order.

This morning the committee will take testimony on investment, debt, credit, and tax issues on agriculture, principally what we are talking about throughout the Government.

There is one point on which there appears to be unanimous agreement, that being that many producers in various parts of the country are experiencing financial stress. The cause of these problems obviously vary from one farm operation to another, and to some extent they happen in good times and bad, but the stress in some areas of the country is particularly acute at this time.

Proposals for short-term solutions to these difficulties were discussed in great detail on the floor of the Senate a week or two ago, and our hearing this morning will go beyond the immediate problems and, I trust, will not revisit the short-term emergency proposals. Rather we will examine the causes of stress in American agriculture and long-range policy options before Congress to resolve them. I emphasize long-range policies because our hearing today is on provisions to be contained in this year's farm bill which will take effect after, and I stress the word "after," this crop year. So this legislation will, obviously, have no impact on the immediate credit and debt situation.

Our hearing this morning will focus on the impact of Federal agricultural credit programs, State and Federal tax laws and statutes which encourage or inhibit private sector investment in the farm economy.

It is apparent, at least to this Senator, that many of our problems at the Federal level have contributed to the problems facing many of our producers. A great majority of the Farmers Home Ad-

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ministration borrowers are in financial difficulty, and they rue the day they took advantage of the easy credit of the agency during the late 1970's. Rather than helping farm borrowers toward stable operations, these credit policies, in so many cases, resulted in farmers being virtually enslaved by ever-increasing debt loads that many of them cannot ever hope to repay.

So the programs of the Farmers Home Administration, the primary Federal agency involved with agricultural lending, have, in fact, enticed a number of farmers to incur large debts that are now keeping some borrowers from obtaining necessary credit this spring. The availability of large amounts of credit at accommodating interest rates and terms have acted as a sort of narcotic, I guess I could call it, to many marginal farm operations. The first fix of subsidized credit resulted in many farmers' addiction to subsequent doses that not only impaired their ability to move to private sector lenders but at the same time burdened them with so much debt that economically viable operations are now all but impossible for them.

I have introduced legislation containing proposals in the credit title which target the Farmers Home Administration for substantial change, and I believe we must again designate this agency as what we call the lender of last resort. The obligation of the Government in the area of agricultural lending is not to provide an unending stream of capital at lower than market interest rates, but rather to assist borrowers for a temporary period in obtaining credit they need.

Federal guarantees will provide that assistance better than direct lending programs.

The Farmers Home Administration held only 3 percent of the nonreal estate credit market in 1975, and this year has grown to 15 percent in 1984. The more Farmers Home has tried to help, the greater the stress and here we go again.

There are other areas, as a matter of fact, which are significant to our examination of the debt and credit problems of farmers, and these are the laws in the many States which truly restrict investment in agriculture. Surprisingly, the States which have been most aggressive in legislating investment out of agriculture are the very ones now encountering the most stress. Nothing surprising about that.

This committee certainly wants to hear from our distinguished panel of witnesses on what effect these laws have had on Midwestern farmland values.

Another factor often cited as contributing to our current difficulties in agriculture are some of our tax policies. Now, our tax laws often encourage the ownership of farms by nonfarmers, hoping to harvest a crop of tax benefits rather than commodities. This situation so often works to the detriment of full-time farmers whose sole source of income comes from agriculture.

So, with these issues in mind, we look forward to hearing from our witnesses who are distinguished authorities in those areas.

Now, I understand that one of our witnesses is delayed in arriving, but we will proceed anyhow. We have Dr. Emanuel Melichar, who is a senior economist of the Division of Research and Statistics, Board of Governors, Federal Reserve System in Washington;

and Dr. Michael Boehlje, assistant dean, College of Agriculture, Iowa State University, Ames, IA; and Dr. George D. Irwin, associate deputy governor and chief economist of the Farm Credit Administration of McLean.

If the two gentleman will take seats here, I am sure you are very familiar with the standard operating procedure of congressional committees. We always say, rather hopefully and wishfully, that your full statements will be printed in the record for all Senators to read. You may summarize it.

Senator McCONNELL. Senator, I have a short opening statement.

The CHAIRMAN. Please forgive me.

Senator McCONNELL. I ask that it be inserted in the record.[1]

The CHAIRMAN. Senator Melcher, I apologize.

Senator MELCHER. I have no statement, Mr. Chairman.

The CHAIRMAN. Thank you, sir. Senator Dixon.

STATEMENT OF HON. ALAN J. DIXON, A U.S. SENATOR FROM ILLINOIS

Senator DIXON. Mr. Chairman, I am pleased to be here today at the last in a series of thematic hearings held by the Agriculture Committee.

Capital investment, debt, credit, and taxes are among the most important elements of our agricultural policy. I look forward to hearing the testimony this morning, and hope that our witnesses may be able to give this committee some solutions to the serious problems we face in the agricultural sector of this Nation.

Thank you, Mr. Chairman.

The CHAIRMAN. Dr. Boehlje, we will start with you and, Dr. Irwin, we will be delighted to hear from you. You may proceed. Thank you very much for the time and effort you have spent in preparing for this, and I assure that the information you convey will be distributed to Senators and be used in the floor discussion as well as the committee consideration of the farm bill.

Thank you very much and you may proceed.

STATEMENT OF DR. MICHAEL BOEHLJE, ASSISTANT DEAN, COLLEGE OF AGRICULTURE, IOWA STATE UNIVERSITY, AMES, IA

Dr. BOEHLJE. Thank you very much, Senator Helms, members of the committee.

My name is Mike Boehlje. I am the assistant dean of the College of Agriculture at Iowa State University, also a professor of economics at Iowa State University.

I will be reporting on work that has been done by a debt crisis task force at Iowa State University that has been looking at this issue of financial stress in agriculture for the last approximately 10 months. I will be referring to some tables in the formal statement and also be reading part of it and summarizing other parts of it.[2]

We know that farmers are currently facing very severe financial stress resulting in asset liquidation, problems in obtaining credit and even, as indicated, bankruptcies. Emanuel Melichar has done some of the first work in documenting this financial stress problem in agriculture. If you look at table 1 of the prepared material, which is on page 17, you will see a summary of his results presented in January 1984. I am not going to go through those in detail. I want to, instead, proceed to Iowa data and then more recent data of the same variety as Melichar presented. I had anticipated he would have already summarized that information and he may when he arrives.

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[1] See p. 247 for the prepared statement of Senator McConnell.

[2] See p. 247 for the prepared statement of Dr Boehlje.

We did a survey in Iowa in January 1984, it is summarized in table 2, and that survey showed in very rough approximations that approximately one-third of our farmers are in a position where their debt-to-asset ratio exceeds 40 percent and, therefore, are encountering cash flow problems. That one-third of the farmers holds two-thirds of the debt, and that is one of the fundamental concerns we have, the issue of the distribution of that debt. According to the survey in 1984, 10 percent of our farmers in Iowa had debt-to-asset ratios exceeding 70 percent, and our analysis indicates that those farmers will not be able to make principal or interest payments this year.

I use that as a base to start from because there have been more recent data that I think is useful to look at. The Farm Journal along with the Food and Agricultural Policy Research Institute in 1985 did a survey as of January 1. They found in that survey that nationwide 15.4 percent of farmers have debt-to-asset ratios exceeding 70 percent and 17.9 percent have debt-to-asset ratios of 40 to 70 percent. Those farmers account for 30.8 percent and 34.9 percent of the debt, respectively.

If you look at those numbers basically they indicate, and this is on pages 2 and 3 of the prepared comments, that nationwide the Nation is where Iowa was last year. Let me repeat, the Nation is where Iowa was last year.

Furthermore, for the Central States the Farm Journal data indicate that 21 percent of farmers have debt-to-asset ratios exceeding 70 percent and 21.5 percent have ratios of 40 to 70. That implies to us that the Central States have deteriorated significantly within the last year.

It is important to recognize that this problem can move very, very quickly. In fact, our analysis indicates at current interest rates and with the current decline in asset values if a farmer is in a position where he starts out with a debt-to-asset ratio of 60 percent, he cannot make his interest payments because of the cash flow problem being encountered. If that interest is added on top of the debt, and on top of that his assets decline in value 10 percent per year, within 2 years he is in bankruptcy. So this problem moves very, very quickly.

In the 1970's the problem, the financial condition was such that things could not deteriorate all that rapidly; but with the pinchers move we have with high interest rates, high debt loads and declining asset values, it moves very, very quickly.

We also cite on page 3 the USDA data which were just recently released, indicating that 6.3 percent of the family-sized farms in the United States with 9.3 percent of the debt are insolvent. Debts exceeding assets; 7.4 percent of the farms with 11.1 percent of the debt have debt-to-asset ratios of 70 to 100 percent; and 20 percent of the farms with almost 26 percent of the debt have debt-to-asset ratios of 40 to 70 percent.

These studies, I think, suggest to us that the problem, No. 1, is nationwide and, No. 2, the problem is becoming much more severe and severe very quickly.

The **Chairman**. Could I interrupt you, and I know I should not do this——

Dr. **Boehlje**. I will be happy to have you interrupt.

The **Chairman** [continuing]. I want to follow that train of thought just a minute.

Hypothetically, suppose this Congress should have an outburst of common sense, which is unlikely, and as a result of which interest rates would fall to the single digit. Let us just pick 8 percent.

How would that affect these tables, these statistics you just gave?

Dr. **Boehlje**. Well, in rough numbers, a 1-percent decline in interest rates would result in about a $2 billion increase in net farm income, so it would significantly improve the situation if we were to have a 2- or 3-percent decline in interest rates—it would slow down the deterioration. However, I think it is important to recognize that even with lower interest of 2 to 3 percent, we still would probably have to have some changes in the ownership pattern of assets and a lowering of the total debt load.

My judgment is that even with interest rates 2 to 3 percent lower, we still would have an excess debt load in agriculture, or at least it is too highly skewed and carried by too few people.

The **Chairman**. Then I will let you proceed because I am fascinated by your presentation. That would have a significant impact on the number of marginal farmers though, would it not?

Dr. **Boehlje**. It certainly would, and it would, hopefully, as we suggest later, protect us from continuing downside movement in land values. That is a fundamental concern we have because property in many cases is being put on the market because the people owning it cannot afford to continue to hold on to it.

The **Chairman**. So, in a very real way—this is the last thing I am going to say and I will let you proceed in your testifying, but I did want to get this in while it is in my mind—the Federal Government deficit problem is also the farmers' problem, is it not?

Dr. **Boehlje**. I think very clearly it is, and it has two dimensions. One is that it has impacted significantly the direct cost of production through higher interest rates and, second, it has significantly impacted our ability to export commodities and, in a sense, has put a tax on exports.

We have done some back of the envelope number crunching that suggests that a 3- to 4-percent decline in interest rates could increase net farm income by somewhere around 50 to 60 percent, if you include the potential increase in foreign demand due to the change in the value of the dollar, and the lower direct costs of interest obligations.

The **Chairman**. Bob Dole and I had a little song we sing in duet, the title of which is that we need not mention the word farmer or farm or agriculture in a farm bill if we just work on that budget and get the interest rates down.

Dr. **Boehlje**. It would be of immense help.

The **Chairman**. Yes, sir. I apologize for interrupting.

Dr. **Boehlje**. I would be happy to respond to other questions.

The **Chairman**. I know that you will say for the record that you and I have never met, and we have never discussed this before.

Dr. **Boehlje**. That is correct.

The **Chairman**. This was not a setup job.

Dr. **Boehlje**. Not at all.

The **Chairman**. Thank you very much.

Senator **Melcher**. You are aware that is going to be the case in any event? [Laughter].

Dr. **Boehlje**. Let me proceed on page 4.

It is important to recognize that the financial stress problems at the farm level have implications beyond the farm gate, and so we have tried in our task force at Iowa State to document some of those implications. The first is the shortfall in interest and principal payments that lenders will not receive this year.

Two of my colleagues at Iowa State have estimated that that shortfall will amount to approximately $2.2 billion in terms of scheduled interest payments that the lending community will not receive this year, and somewhere around $6 billion of scheduled principal payments that they will not receive. Those shortfalls clearly have implications for the earnings and the liquidity of the lending community and, furthermore, we think lenders will encounter significantly higher loan loss ratios in the future. That puts financial stress on the lending community.

Our preliminary analysis indicates that with loan loss ratios in the 3- to 5-percent area, which are higher than are currently being faced by most lenders, but are in fact being faced by some lenders, combined with the shortfall in interest and principal payments, many sound lenders, even those with a 20-percent equity, could remain in business for only 3 to 4 years.

Second, the agricultural input supply firms are encountering problems. Our analysis of cooperative input supply firms in the Central States indicates that one-third of them have debt-to-asset ratios exceeding 70 percent. If bad debts total 1 to 2 percent of sales, 25 percent of those input supply firms will encounter debt servicing problems, and bad debts of 3 to 4 percent would result in almost 50 percent of those firms with debt servicing problems.

Now, to put that bad debt in perspective, those firms in the survey we completed had 1 percent of their sales in accounts receivable of 180 days or greater. According to most business analysts, anything above 180 days or greater has a very low recovery rate. Another 1 percent of accounts receivable are outstanding between 60 and 180 days.

What this means is that before we even advance funds for this year's crop, we have many firms with 1 to 2 percent of their sales in accounts receivable over 60 days and are, therefore, quite financially vulnerable with respect to bankruptcies and performance on their accounts receivable, bad debt problem, et cetera.

Our analysis indicates that the agribusiness sector, particularly the input supply business, is not in a much different situation than the farm sector in terms of financial stress.

The one final point I note on page 5 is that there is a broader effect as it relates to income and employment. Paulsen and Otto of the task force at Iowa State have estimated that from 1977 to 1982, we have lost approximately 260,000 jobs in the agriculturally related industries because of the agricultural recession. They also estimate an approximate $5.1 billion loss in income in the nonfarm sector due to the farm recession.

Clearly, these reductions in income and employment cannot be attributed to the current debt crisis in agriculture, but they do indicate over a longer period of time the economic and financial problems of farmers are felt throughout the rest of the economy, not just in the form of higher priced food, but in the form of fewer employment opportunities and lower incomes for those in farm-related industries.

The next section of my written testimony includes a discussion of some of the causes or dimensions of the financial stress problem in agriculture. In the interest of time, I am going to include that in the record and you will have a chance, and others, to review it. I think it provides a historical perspective which is useful, but maybe at this stage everybody has a reasonably good understanding of it.

I would like to proceed to page 11 and talk about implications of the financial stress for the 1985 farm bill.

The current debate about the 1985 farm bill is occurring in this aforementioned environment of severe financial stress for many farm and agribusiness firms. What then does it imply about the choices of the provisions of that bill? Two specific dimensions. First, although providing substantially more income and price support through a farm program will probably not significantly alleviate the financial stress for many farmers, the reverse in our judgment is not true. Research completed by our Food and Agricultural Policy Research Institute indicates that rapid movement to a market-oriented farm program would result in significantly lower prices and net farm income. A comparison between a continuation of the current farm program and a market-oriented program, much like that proposed by the administration, indicates that corn and wheat prices would be approximately 15 to 20 percent lower and net farm income would be $5 to $10 billion lower under the free market option, almost a 30- to 40-percent reduction in net farm income.

This significant reduction in income would dramatically compound the financial stress problem in our judgment. For example, the shortfalls in interest payments to lenders would more than double from their current $2.2 billion level, and principal repayment shortfalls would increase by 25 to 30 percent because of nonperforming loans. Land values which have fallen by approximately 40 percent in Iowa since 1981 to an average value of $1,350 per acre, would have to decline another approximately 50 percent if corn prices, market plus Government program, were to stabilize at the $2.50 to $2.60 per bushel level as suggested by the FAPRI analysis of the free market option. This decline in land values would further undermine the collateral base for much of the agricultural loan portfolio of the agricultural lending community.

Thus, in our judgment, rapid movement to a market-oriented farm program would significantly compound the financial stress in agriculture and lead in greater losses to the financial markets or increased costs of public financial assistance programs which will offset in part the cost savings in commodity programs.

A second issue, in our judgment, and one that is very critical, is the concern we have about the issue of collapsing land values. We think that consideration should be given to a provision in the 1985 farm bill that would target some of the benefits of that bill specifically to those who currently are encountering financial stress. One alternative approach would be to implement a targeted interest rate buydown that would reduce farmers' interest rates and cover part or all of the interest payment shortfalls. Such a buydown would not be available to all farmers irrespective of their debt obligations, but would be targeted to those whose debt load is heavy and whose cash-flow is insufficient to meet debt obligations.

Another alternative is to authorize the formation of an entity to acquire nonperforming debt and possibly the indebted assets and isolate them from the markets. The objective of such a policy is to develop an alternative to foreclosure and sale of indebted assets by private sector lenders which, given the large number of nonperforming loans, would quickly result in a glut of land and other capital assets on the markets and depress prices and collateral values even further. This entity would be a temporary holding tank, if you will, for excess land that could not be absorbed by the market. Such an entity has been proposed by Professor Harl of our faculty. A variation of this entity called an Agricultural Conservation Corp. has been proposed by the Farm Credit Council.

If the entity did accrue property, it could not only protect burdened farm real estate markets, but it could also be placed in a conservation reserve to reduce soil erosion and excess productive capacity. A further variation of this concept is to authorize the formation and block grant funding of State agricultural investment banks that would acquire indebted assets from lenders and others, as well as make loans to facilitate the acquisition of land by creditworthy borrowers.

Let me conclude. I think it is clear that we have a financial stress problem in agriculture. It seems to me that given the complex nature of the stress problem, a public policy approach that focuses only on prices may be ineffective. We think that price and income support programs which have been a major component of agricultural policy in the past may not solve the financial stress problem.

On the other hand, reducing the Government safety net for agriculture by lowering price and income supports, we think, will dramatically compound the problem of financial stress, because lower prices will result in significantly lower land values and further loan defaults in our judgment.

As you noted in your comments, Senator, there have been a number of short-term options that have been proposed. We think that many of those are short-term options. While some people would argue that the spiraling farm debt suggests that debt restructuring is the answer to the current financial stress, a restructuring of agricultural assets remains the key to a long-term solution. The rearranging of liabilities is not a permanent solution to the current financial stress problem because even with more time to repay many farmers will not be able to service their debt with current or higher interest rates, productivity and input and commodity prices. However, debt restructuring is an important mechanism for buying time to implement more permanent solutions.

Interest rate buydowns may also be an effective short-term policy for buying time, but asset restructuring, including liquidations, debt reductions and equity infusions, we think will be required to improve the chances of long-term survivability of many farm businesses.

One of the key objectives of any public policy to alleviate financial stress should be to protect the resource markets from collapsing. We think that is critical to maintaining the stability of the agricultural production sector and rural communities. If resource values decline precipitously because of excessive supplies being offered to a market that has no liquidity to absorb them, many farmers who were a good credit risk will no longer be so because of the declining collateral values. Mechanisms to stabilize land values at economically supportable levels, including new loan agencies such as agricultural investment banks or a land holding entity such as an agricultural land reserve, should be evaluated to minimize the potential of a land market collapse.

That is the end of my statement. I would be pleased to respond to questions.

The CHAIRMAN. Very fine.

We welcome you, sir. I was about 7 minutes late myself. They call me the late Jesse Helms around this place. Did you have a late plane?

Dr. MELICHAR. No, I have no excuse like that. In working on my data and statement I came up exactly half an hour short.

The CHAIRMAN. I do it all the time. It is endemic to this town.

We are delighted to have you and appreciate your coming. You may proceed. As I indicated earlier, just like all the rest of the committees in Congress we say at the outset that your full statement will be printed in the record and if you want to summarize or however you want to handle it, please proceed. We normally find that by questioning you we develop a lot of thoughts as well, so we are delighted to have you, sir.

STATEMENT OF DR. EMANUEL MELICHAR, SENIOR ECONOMIST, DIVISION OF RESEARCH AND STATISTICS, BOARD OF GOVERNORS, FEDERAL RESERVE SYSTEM

Dr. MELICHAR. I am going to limit the content of my statement to some current and quite interesting data on the farm lending experience of agricultural banks and banks in general in 1984 and other recent years.[1] The data for 1984 that I will be quoting are preliminary estimates based on reports that were available from banks on March 8.

By that time over 99 percent of banks had reported and with some special editing the data appear quite useful.

Net chargeoffs of farm production loans is a new item on bank reports. In 1984 chargeoffs of these farm loans were equal to 2.2 percent of such farm loans outstanding at the end of the year. Relative farm loan chargeoffs were highest by far in the State of California, at 6 percent of outstandings. The relative chargeoffs in the other 49 States averaged 1.8 percent.

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[1] See p. 256 for the prepared statement of Dr. Melichar.

As shown in table 1, other States with relatively high farm loan chargeoffs were located in the Western Corn Belt, the Great Plains area, and Alabama, and Georgia in the Southeast. The data presented later will indicate that the relative rate of farm loan chargeoffs was much higher than the chargeoff rate for all loans at agricultural banks, and the latter rate in turn was about double the rate of chargeoffs on total loans at other small banks.

Net chargeoffs of farm production loans totaled about $900 million in 1984, of which $240 million was reported by banks in California.

Next I turn to data on delinquent farm loans at banks. Banks have been reporting amounts of delinquent farm loans since 1982. However, the reports are incomplete because only relatively large banks with assets of $100 million or more report nonaccrual and renegotiated farm loans, the worst of the bad loan categories. These large banks account for only 31 percent of farm production loans at banks nationally and for a much smaller percentage than that in the highly rural States. So I will present some estimates that represent an attempt to fill in the gaps in these data

Table 2 presents data on farm loans that are past due but still accruing interest, which must be reported by most banks engaged in farm lending. At year end these past due loans represented 3.8 percent of farm loans outstanding, a level that has not changed much since the first reports in 1982.

During this period, however, the proportion of farm loans past due fell in some States, such as California, but rose in most Midwestern States.

At large banks required to report all categories of delinquent farm loans, the total has remained near 10 percent of outstanding loans over the past 2 years. However, farm lending at these banks is disproportionately concentrated in California, where large banks make most of the farm loans. At the end of 1984, total delinquent farm production loans at large California banks averaged 13 percent of loans outstanding, whereas in other States the average at large banks was 9 percent. The nonaccrual component of the California loans averaged 8 percent of loans outstanding, compared with just under 5 percent in other States.

I might mention that the relatively high farm loan delinquencies do not pose a serious threat to large California banks because farm loans at each of those banks is approximately 4 percent of the total loans at the bank. That is also the proportion that farm loans are of total loans in the banking system nationally.

As I have noted, small banks have not been required to report nonaccrual farm loans. They do report their total nonaccrual loans, and from these data, which I show later in table 4, it appears that about 3 percent of the farm production loans at small banks were in the nonaccrual category. When this figure is averaged with the 5.8 percent in nonaccrual status at the larger banks that account for 31 percent of farm loans, it appears that about 3.8 percent of all farm production loans were in the nonaccrual category at the end of 1984.

These estimates are summarized in table 3. About 5 percent, or $2 billion, of farm production loans were nonperforming; that is, the nonaccrual loan, loans past due 90 days or more and still accruing, and a small amount of renegotiated loans.

Another 2.6 percent, or about $1 billion of farm loans was reported as past due 30 to 89 days.

Summing these figures, about $3 billion of farm production loans at banks were delinquent, or 7.6 percent of the total, now about $40 billion.

The remainder of the statement concerns the experience of agricultural banks, the banks that are heavily involved in farm lending.

Farm loans, as I mentioned, constitute only 4 percent of loans outstanding at all banks, but many small banks have a much higher farm loan ratio. The unweighted average of the farm loan ratios at all banks is now about 17 percent. If you calculate each bank's farm loan ratio, add them up, and divide by the number of banks, you now get about 17 percent, and about 5,000 banks have a ratio that exceeds that figure, which I will refer to as agricultural banks.

The recent experience of these banks has been dominated by the rise in farm loan delinquencies.

In table 4 and several other tables that follow, in the top panel, the first two lines contrast the experience of agricultural banks as a group with that of small nonagricultural banks, which are banks with assets under $500 million that have a below-average farm loan ratio.

The lower panel provides additional insight into the effect of farm loans on bank experience by dividing all the small banks into 18 classes according to the relative importance of farm lending.

Loan delinquencies still were lower at agricultural banks 2 years ago, than at other small banks. At the latter banks relative delinquencies were peaking as the business recession was ending. Meanwhile, delinquencies at agricultural banks were rising from a lower level.

At the end of 1983, 1 year later, delinquent loans at agricultural banks reached the same relative level as the recession peak at other small banks. And after 1 more year, at the end of 1984, delinquent loans at agricultural banks had risen further to 6.2 percent of total loans and were now well above the average of 4.7 percent at other small banks.

The CHAIRMAN. Dr. Melichar, I apologize, as I did with the other gentleman. I need to get this in some sort of perspective for me. I do not guess there is any such thing as a normal year.

Dr. MELICHAR. Not lately.

The CHAIRMAN. But let us go back into the past 10 years.

How materially would these figures have changed here or here in a so-called normal year?

Dr. MELICHAR. For loan delinquencies, we cannot really answer that question because banks were not required to report that prior to December 1982. So what is shown here is the first report we have. However, as soon as we turn the page to table 5, we will see data on chargeoffs on total loans, bank profits, and bank capital. And I show those data back to 1979, and the figures for 1979 at these banks were approximately the same as they were through the seventies, which is why I chose to go back to that year.

The CHAIRMAN. All right.

Dr. MELICHAR. Of the four categories of delinquent loans, nonaccrual loans rose most rapidly, and that is quite evident in table 4. At banks with farm loan ratios over 50 percent, nonaccrual loans rose from about one-half of 1 percent of total loans in December 1982, to about 2½ percent of total loans only 2 years later.

Now we get to the data that are available over a longer period, and the first item is total loan chargeoffs, which have risen substantially at agricultural banks since 1980. Last year 1.2 percent of the yearend level of loans was written off by agricultural banks. That was double the relative level at other small banks, but you might note that it is lower than the 2.2 percent that I have cited for farm loans alone.

With relative chargeoffs at agricultural banks now higher than at other small banks, we now have the opposite of the situation that prevailed for many years before 1983, as you can see by comparing the top two lines of table 5.

Net income at agricultural banks was sharply reduced by loan losses, as shown in table 6. However, these banks have been relatively profitable in the past, and in 1984 the return on equity still averaged 9 percent. That was down from an average of 16 percent in both 1980 and 1974, which were the two previous cyclical peaks in profitability at agricultural banks.

In each year since 1980, a larger proportion of agricultural banks experienced loan losses that were larger than their net earnings prior to covering the losses. In 1984, 16 percent of agricultural banks made loan loss provisions that exceeded 2½ percent of yearend loans outstanding. Mainly because of such loan experience, 12 percent of agricultural banks reported negative net income for 1984 compared with an average of 1 percent of such banks during the 1970's.

On the other hand, even last year, 32 percent of agricultural banks needed loan loss provisions of less than four-tenths of 1 percent of outstanding loans. In fact, 59 percent of the banks made loan loss provisions under 1 percent. Thus, nearly one-fifth of agricultural banks reported earnings over 15 percent return on equity in 1984, and over half the banks earned a return on equity greater than 10 percent.

The CHAIRMAN. Would you say that again? Give me those figures again.

Dr. MELICHAR. We have a mixed picture. Twelve percent of agricultural banks reported negative income last year. However, a larger fraction, 19 percent, reported that their rate of return on equity was above 15 percent. So just as some farmers have a positive income, and aggregate net farm income after interest payments is positive while some farmers are going bankrupt, banks are having varied experience. Some had loan losses greater than their earnings from operations last year, but over half are still earning more than 10 percent on equity even after covering loan losses.

Because most agricultural banks maintained positive earnings while their growth was slowed by a weak farm economy, relative total capital at the banks rose still further in 1984, reaching an average of 9.5 percent of assets. This is shown in table 7. Relative capital of agricultural banks now averages a full percentage point above the capital ratio at other small banks. Furthermore, the more heavily agricultural a bank is, the higher the capital ratio tends to be, as table 7 indicates. And, the capital ratio at the more highly agricultural banks rose significantly again last year, as shown in the last few lines of table 7, in spite of the relatively high loan losses at these banks.

However, the favorable capital position of most agricultural banks provides a limited cushion for coping with adverse loan experience. If relatively large loan losses occur in a short period of time and thus cannot be covered from current earnings, capital can be depleted rapidly. At agricultural banks, loans average about 50 percent of assets and capital averages nearly 10 percent of assets; therefore, if loan losses equal about 20 percent of outstanding loans, they would on average deplete all capital, if we ignore the income stream from current operations.

During the past 2 years, banks that failed came predominantly from the group of banks that had earlier reported levels of delinquent loans that exceeded total capital. In table 8, I have tabulated that group by State. Nationally, the number of such banks rose by about a third in 1984, to over 600 banks, which is 4 percent of all banks.

There were significant increases in the number of such banks in several highly agricultural States, Yet, in most of these States—Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, Wisconsin—the proportion of banks with delinquent loans greater than capital at the end of 1984 was still roughly equal to the national average of 4 percent.

In other words, the deteriorating situation started from a very good level. On average, agricultural banks started with very few loan problems and their loan experience has now deteriorated to approximately the national average.

Furthermore, as shown in the last column of the table, farm loans at this group of 600 banks nationally averaged only 7 percent of total loans at the banks. That is higher than the 4 percent average in the whole banking system, but it is still a relatively low percentage. In several States with a relatively high number of these potentially vulnerable banks—California, Florida, Louisiana, Oklahoma, Tennessee, and Texas—the very low average farm loan ratio at these banks indicates that farm loan difficulties play only a minor role in their loan problems.

The CHAIRMAN. Doctor, you have to explain it to me.

Now, let us take Nebraska in table 8 just as an example.

Dr. MELICHAR. Right.

The CHAIRMAN. The 22 banks are 5 percent of the total number of banks, is that right?

Dr. MELICHAR. Yes.

The CHAIRMAN. So that means about 440 banks? You are talking about 22 banks out of 440 in Nebraska, OK.

What does the $117 million relate to?

Dr. MELICHAR. First of all, the 22 banks had delinquent loans greater than their capital.

The CHAIRMAN. Here again you do not have any figures prior to 1982?

Dr. MELICHAR. That is right. December 1982 is the first date for which there is data on delinquent loans.

The CHAIRMAN. We have nothing to compare them with?

Dr. MELICHAR. That is correct.

The CHAIRMAN. Obviously, this is not hard on those banks, but I am wondering what the normal flow is, if there is any such thing as normalcy?

Dr. MELICHAR. In these agricultural States in the Corn Belt, the prosperity of the farm economy there for several decades would lead me to suspect that there were relatively low levels of delinquent loans at these banks. In fact, even as late as 1982, when problems had already developed, there were a very low number. Further evidence is the very low level of bank failures. Banks simply did not fail because of bad credits, but usually because of fraud and problems of that type.

Now, the $117 million is the sum of the farm loans at those 22 banks.

Senator MELCHER. Does that include consumer credit?

Dr. MELICHAR. Yes. The definition of farm loans covers both loans secured by farm real estate and loans to finance agricultural production and other loans to farmers, and is intended to include all the loans of a farm family. However, in the instructions to the bank, we say that we do not want to have this intent present an onerous reporting burden to the bank, so we may be missing some loans that might be made in a consumer department, for instance, particularly at a larger bank. But it is intended to capture all loans to farmers for any purpose.

Senator MELCHER. My question is not directed to that. It is not a loan made by the bank. The question is directed at those loans not made by the bank but the farmer is obligated to pay.

For instance, a pickup financed by, say, GMAC. Would that show up?

Dr. MELICHAR. Here we are looking only at the loans made by banks and not at any other farm debt, such as that owed to a finance company or the farm credit system. I am not covering that at all, just the bank debt.

Senator MELCHER. There could be an awful lot of loans then that would not be covered. The machinery dealer may have his own company that financed the purchase.

Dr. MELICHAR. So a bank might have a loan to a machinery dealer who, in turn, perhaps was financing the farmer. That would not show up as a farm loan. That would be classified as a business loan in bank reports.

Senator MELCHER. It would affect the loan picture, would it not, with individual farmers?

Dr. MELICHAR. No, because other data, such as are compiled by the Department of Agriculture, would be capturing that debt. They estimate debt owed to individuals and others, from other sources of information. This is only the loans at banks.

Senator MELCHER. Do you not see that as quite a blank spot?

Dr. MELICHAR. Well, the other loans would in a sense be irrelevant to the farm loan experience of the banks themselves. Obviously, agribusiness firms in the rural economy would tend to have the same financial problems or reflect the financial problems of the farmers who are the principal income generators of the community.

Senator **Melcher**. You are going to have to pay that interest out of earnings from that farm as far as the value of the collateral for the farm.

Dr. **Melichar**. Yes.

The **Chairman**. Continue, Doctor.

Dr. **Melichar**. In tables 9 and 10, I contrast the relative proportions of agricultural and other small banks that have been troubled by problem loans over the past 2 years.

Do you feel we have sufficient time to look at this table or would you rather I skip that?

These tables look complex at first glance. But once you get the idea, it is quite interesting and gives a bird's eye view of the situation at agricultural banks and at nonagricultural banks over a period of 2 years. In each panel of the table, the banks are cross-classified by relative capital and relative total delinquent loans—symmetrically cross-classified in that the class intervals are similar.

So the seven columns show capital as a percentage of total assets. In each panel, the seven lines show delinquent loans divided by total assets. The class intervals are the same in the columns and the stub. So, if a bank is on the diagonal of the table, where I have drawn the diagonal line, the delinquent loans and the capital are equal—or roughly equal because we are working with class intervals. So if a bank is above the diagonal, capital exceeds delinquent loans, and the further that it is away from the diagonal, the more the capital is greater than delinquent loans. If banks are below the diagonal, then the delinquent loans exceed the capital. And the further it is below the diagonal, the more delinquent loans exceed the capital.

So if you look first at the nonagricultural banks, which are shown on the left side, in table 9, and then contrast that picture with the same panel on the right-hand side, in table 10, you can see that definitely the nonagricultural banks were in a generally worse position than the agricultural banks at the end of 1982. Going to the middle panels, for 1983, the nonagricultural bank picture looks roughly unchanged. But for the agricultural banks, the picture is worsening. By December 1984, the two look alike. But if you look closely, the percentages below the diagonal at the agricultural banks are slightly larger in total than the percentages at the nonagricultural banks.

The **Chairman**. What do you mean by the diagonal?

Dr. **Melichar**. It is that line that looks like a staircase.

The **Chairman**. Maybe I am looking at it crank sided, but I do not see a lot of difference.

Dr. **Melichar**. That is the point I am making.

The **Chairman**. I thought you said to the contrary.

Dr. **Melichar**. Well, in 1984 it is more equal than not. In the top panels for 1982, you can see that the nonagricultural banks are definitely worse off, with more bigger percentages below the diagonal line than the agricultural banks. At the end of 1982, the nonagricultural banks, which had been experiencing a couple of quite severe recessions, had bigger problems than agricultural banks. By 1984, the panels look very similar, which is one point I want to make. Looking more closely, the agricultural banks have passed slightly the nonagricultural banks. The nonagricultural banks are improving slightly as the business recovery continues.

Now, I want to look quickly at a more vulnerable subgroup of banks using the same analysis, and that is the banks at which the nonperforming loans alone exceed total capital. Tables 11, 12, and 13 repeat the same analysis using this more stringent criterion. We are not including now the delinquent loans that are only 30 to 89 days past due, but rather only the nonperforming loans that are not accruing or are 90 days or more past due.

The last column in table 11 indicates that farm loans figure more prominently at these banks, averaging 15 percent of total loans, whereas in table 8 the average was 7 percent.

Table 12 shows that the number of small nonagricultural banks with relatively high nonperforming loans changed little over the last 2 years.

In table 13, the number of agricultural banks below the diagonal more than tripled over the 2-year period. It is still smaller however, than the number of nonagricultural banks in the same position. Here I am comparing the bottom panels in tables 12 and 13. A higher percentage of agricultural banks are below the diagonal at the end of 1984, but the small nonagricultural banks outnumber agricultural banks by about 9,000 to 5,000, and there are still more nonagricultural banks below the diagonal, by about 50.

This is leading up to a discussion of bank failures. In 1983, only 7 of the 44 insured commercial banks that failed, or 16 percent of the failures, were agricultural banks. Last year, 32 of the 78 failures that are listed in table 14, or 41 percent of the failures, were agricultural banks. Table 14 also shows that farm loans constituted only 10 percent of total loans at the banks that failed in 1984. At these banks, the sum of their farm loans at the beginning of the year was only $199 million. So they tended to be very small banks, small even by agricultural bank standards.

Last year the number of agricultural banks with a relatively high level of nonperforming loans—the banks below the diagonal—rose to 175 at year-end compared with 87 a year earlier. This may portend a further increase in the failures of agricultural banks, as study of the banks that have failed recently indicates that most came out of the group at which delinquent loans exceeded capital in earlier reports, and particularly from the group in which nonperforming loans exceeded capital in earlier reports.

And that completes my statement.

The CHAIRMAN. We will have some questions.

Dr. Irwin, you have been very patient down there in Alexandria. We appreciate that. You may proceed, sir.

STATEMENT OF DR. GEORGE D. IRWIN, ASSOCIATE DEPUTY GOVERNOR AND CHIEF ECONOMIST, FARM CREDIT ADMINISTRATION

Dr. IRWIN. It is a pleasure to visit with you, Senator.

My emphasis is going to be a little more on the philosophical nature of the longer term aspects of how credit fits into our policy discussions.[1] I do want to start by commending the USDA Agriculture Information Bulletin 490 which has the most recent statistics out on this subject. That is sort of our standard reference in measured dimensions of the overall problem.

I could also comment on specific dimensions of the farm credit system's problems. I do not think that is the primary purpose that I want to use my time for.

The first part of what I want to talk about is a brief summary of a paper we provided you for the compendium on farm policy put together this last winter. We see credit as something that facilitates the accomplishment of changes that take place because more basic economic, social or political or policy factors change. The economy has changed and credit is one of the vehicles for making that change possible without everybody having 100 percent equity. That means to us that credit is not the primary cause of these kinds of adjustments, and it ought not to be the primary tool used in farm policy generally.

Obviously, Government programs have both direct and indirect influences on the kind of forces that influence the farm sector, and we are dealing with financing those forces. I think it is also important to note that only a small part of the influences now affecting agriculture come under the jurisdiction of the USDA and perhaps even this committee.

We have mentioned earlier this morning such things as international policy, monetary policy, fiscal taxes—and all of those in addition to the 1985 farm bill are the major instruments of public policy that are going to make a difference.

Credit programs can help you implement those policies. They can help you adjust to those factors.

For the longer term, the effective way for the Government influence is by modifying these forces rather than dealing directly with credit delivery, but government can also smooth up the process by dealing with some credit mechanisms.

And, of course, whatever level you set for economic activity by all these various programs determines the environment in which lenders are going to have to operate, how liberal or how conservative their standards are going to be, what their evaluation of the overall profitability is going to be, and how much financing they are going to put into the farm sector, other than by the farm credit system where the lenders are totally restricted to the farm sector.

So there are two different kinds of questions about farm commodity policy. One is the level at which you provide support, and the other is, even if you put the level down at the market, do you do some year to year stabilization against these violent disruptions that can occur from effects of policies in the other areas.

We do not really have any particular advice as a credit organization except that, as we are supervising these financial organizations, we have to take all those factors as given in determining how much financing ought to exist in the farming sector. There is a really important linkage, of course, between direct Government programs and credit such as the Farmers Home Administration provides and what commercial lenders, such as the farm credit system and commercial banks, insurance companies, are providing. It seems to us that the ultimate goal of Government credit programs must be to provide temporary assistance to groups that cannot make it with the private lenders, and where there is some public purpose deemed to be served by doing so.

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[1] See p. 278 for the prepared statement of Dr. Irwin.

You can view Government "soft credit" programs as providing subsidized entry opportunities where there is too great a risk to commercial lenders, and there is some reason you want this group to enter, or you can view them as bridging a temporary period of excessive risk faced by established producers, due to uncontrollable natural or economic disasters.

I think we should emphasize the word "temporary" in both cases, as far as any individual user is concerned. If aid has to be permanent, it is probably not desirable.

The Government has provided credit and substitutes for credit another way and to a much broader class of people, and that is through the commodity credit price support deficiency payment and advanced payment programs. Those kinds of things essentially advance the income of a producer from later to earlier in many cases; and if he gets that stream earlier, he borrows less money. Therefore, it has an impact on the lenders.

A particular case occurred in 1983 when the PIK Program provided a lot of money and caused very severe drops in income for cooperatives, very severe reduction in their need for borrowed funds because there were not any inputs going through the channel. So those kinds of programs that I cited are very important for a lending organization.

For the short-term kind of situation, now, I think what we have to say is that you have to work your way out of the current environment to let any longer term program take place. I think what most observers are conceding now is that there is a fundamental adjustment taking place in agriculture. Following rapid growth in the 1970's, and I think you probably discussed this in earlier discussions of your committee, we have had a contraction in the export markets, decreased farm profits, declining land values, but continued high interest rates. We came out of a period when inflation was high and incomes reached records, and land values were escalating.

Economic policy instruments that happened to be used to control inflation have focused the pain of adjustment on farming and the other export sectors, while much of the gain has gone to the rest of the economy. The real question in dealing with the short-term aspects of a 1985 farm bill is whether some of these benefits ought to be transferred over to the farm side. It is also important to recognize the contrast between what we thought was going on in the seventies and our perception now in the eighties is just part of the shorter term fabric of a much longer term adjustment process that has been going on in farming over 50 years now.

We have had declines in farm numbers, large individual farm size, regional relocation of things like cotton production. We have had a growing interdependence between farmers and the U.S. national economy and the world economy, and it seems to us that these kinds of trends cannot be stopped by Government programs except at a very great cost and, therefore, the programs have to be defined in terms of letting most of that adjustment take place in the most equitable way that can be devised.

The seriousness of the immediate credit situation prompted the Federal Farm Credit Board, in its February meeting, to adopt a resolution dealing with stress in agriculture, which committed those at the Farm Credit Administration to work with the administration and Congress in looking for immediate remedies to the short-term stress as well as these longer term adjustment problems. We have received direction, we are looking at a number of policy directions, and would be pleased to discuss these specifics with you in any appropriate time you wish to.

In addition, we have submitted extensive recommendations to Secretary Block, on modifications in the debt adjustment program for the short run, on ways of improving cooperation with the farm credit banks and associations, and on more easily qualifying for the Approved Lender Program.

I want to make just a comment on two points of immediate concern. It seems to us there are misconceptions going around in some quarters. The first point I would make is that the farm credit system financial institutions on a whole are sound. Despite present adversity, record losses, a few failing associations, one or two banks needing assistance, and significant nonperforming assets, the system has sufficient reserves to deal with this current problem it has. What it is dealing with is creating efficient mechanisms to let that happen. But I think we also have to recognize that over the longer term there is a considerably greater concern. We have a distinct possibility that the adversity affecting agriculture will continue for some time into the future, and now seems to be an appropriate time to be thinking about contingencies for dealing with the agricultural sector in case that happens. Among other things, we believe it is important to ensure that a cooperative farm credit system will be able to continue to provide reliable private sector financing to rural America and continue to access financial markets for the decades ahead.

The second short-term point I would make is we have seen a tendency to view any kind of relief for the farm sector as nothing more than bank bail-outs or, in our case, an FCS bail-out. I think that is sort of missing the forest for the trees. The farm credit system is owned by the farmers who borrow from it, and its losses are the farmers' losses, and any time it takes a loss due to a bad loan in the farm credit system, that loss is shared by every other farmer who is otherwise healthy.

These benefits do not accrue to the benefit of a few wealthy stockholders in some organization. They accrue to the farmers, the other farmers who are borrowing. This does not mean FCA is talking about survival of all financial institutions in the rural areas or even in the farm credit system. It says we take it as our responsibility to ensure that a reliable credit system exists in the future for the large majority that are going to continue in operation even after this adjustment takes place.

Senator, that concludes what I wanted to say in my formal comments.

The **Chairman**. Very fine. All three statements this morning have been very helpful to me.

On page 4 of your statement, I underlined, "However, given the distinct possibility that the adversity affecting agriculture will continue for some time into the future," I guess you say no matter what?

Dr. **Irwin**. No matter what.

The **Chairman**. Regardless of what Congress does, meaning——

Dr. **Irwin**. Yes; I think what we are reflecting is that, as we see it, the world has now developed a supply response, if you will, which has demonstrated that we can increase production around the world. In fact, we have. We have also learned that world demand growth is somewhat slower than would have been thought during the seventies. The real surprise is that we did not realize how much debt financing was going into developing countries buying our farm products. That had to come to an end at some time, too. With those kinds of prospects where you have supply worldwide growing fairly rapidly and demand growing more slowly, it says you have an excess production potential everywhere, and all you can do with the exchange rates is give U.S. farmers a bigger piece of the pie at the expense of farmers some place else.

So the only real net hope you can get in the future is to get those interest rates down.

The **Chairman**. Certainly that, and it depends on how much forthrightness we have in terms of foreign policy with respect to trading partners, not only in agriculture but in other areas too. But I find that we are riding a seesaw. If you lift this, something else goes down, and if you pull up the other side, then that goes down.

Dr. Boehlje, let me ask you this question. You said something about a rapid movement to market orientation. I do not know that anybody has contemplated that. Certainly I have not. We are not going to jerk the rug out from under these farmers.

Then you said, on page 14, after having said a rapid movement to market orientation, and I am sure you meant exactly what you said, a rapid movement, I guess a definition of what is rapid would be relevant, but then, on page 14, you said, "Government policies of the past have contributed to today's financial distress by encouraging higher land values, more debt utilization, growth in farm size, and higher interest rates," and obviously both statements are true. I do not know that they are contradictory, but I wanted to point out the seesaw effect.

We sit around here and play legislative games, trying to figure out what is going to happen when we do not even know what the monetary policy is going to do, we do not know what the export situation is going to be, and certainly I think we are a little ambitious in terms of what the Government can do with respect to anybody in the economy.

Now, I happen to be partial to the farmers, but there are others in the Senate who are partial to other segments of the economy.

Now, let me try to get some perspective out of this in terms of what you are telling me. I would like you to give me your assessment of the direction that farm income would take with, and I am going to give you these, three speculative proposals. One would be a less rapid movement to market orientation with a retention of target prices; two, keeping the present policies of inflexible loan rates and voluntary, and the key word there is voluntary, voluntary supply management; or, three, moving to elimination of one-half to one-third of U.S. production capacity through mandatory supply management.

Now, I do not think anybody disagrees that the minute we get into mandatory supply management that is precisely what is going to happen. You are not talking about just the farmer. You are talking about the fertilizer producers, dealers, you are talking about the farm equipment producers, manufacturers, dealers, you are talking about that whole farm system out there. There is no perfect option. Certainly I have not run across one, but I would like for you to take those three proposals and tell me what you think would happen in either case.

Dr. BOEHLJE. Let me make a comment preliminary to that, and that is that I am operating from the premise that we have a very serious financial problem in agriculture that means that adjustments have to be done over a period of time rather than quickly. If we go to some of the proposals I have seen of a 4- to 5-year phase in to market prices, we get very serious financial consequences for agriculture because of the concern about future expectations of what those prices are going to be. It is not just what the price will be in 1987. But if there is an expectation that that price will continue to be in a downward trend all through the late 1980's, that has a definite implication vis-a-vis the issue of land values which we think are extremely critical in this environment because of the concern about the declining collateral base.

Let me talk specifically to your three points. If we were to have a less rapid movement to a market mechanism with a retention of a target price, we would have the potential for stabilization, but at a higher Government cost because I would expect a downward movement of the loan price and a further additional exposure between the loan price and the target price which would then result in increased Government costs. I suspect, quite frankly, there would not really be much additional income for farmers. It would just mean a difference in terms of where they get it, whether they get it from the market or they get it from the Government.

There is, I think, an expectation that significant reductions in the loan rate would result in dramatic increases in exports and prices from the export market. We have done some analysis of that at Iowa State that has indicated that may not be the case at all, and really what you end up with is just a substitution of income from the market for income from the Government, but the total income of agriculture is not any higher. It does reduce Government costs, but the expectation that we are going to get dramatically more income in that fashion we do not think is a reasonable expectation.

Now, the second option that you suggested is to move to a voluntary type of supply control program, at least as I recall. I think the voluntary supply programs, at least in my judgment, have to have sufficient incentive to make that voluntary response effective. One of the concerns we have had about past voluntary programs is that the incentives for participation have not been adequate to make that voluntary dimension a really effective supply control. That is, combined with concerns about the definition of the base in our programs, the fact that the base in some cases is higher than the production we have had, which means that we have to have some participation in the program even to get down to the size of our normal crop acreage. We have some slack in the system that means that we have to pay to get that slack out before we can have any effective supply reduction.

Let me talk about the mandatory supply control concept. We have done an analysis in FAPRI on a mandatory program of approximately a 40-percent reduction in supplies. The short-run implications of that are a dramatic increase in farm incomes. In fact, my recollection, and I do not have the report here, is about a doubling in farm income from that kind of approach. So if that is your only criteria, then mandatory control appears to be a very effective short-run way to solve the income and financial stress problems of farmers. But it does require abandoning the export market, and it does require dramatic reductions in land utilization—about a 40-percent reduction in land utilization—dramatic reductions in the amount of inputs that are going to be purchased, and significant changes obviously in the input processing, input supply, and product processing sector. Those may be costs that may be substantially higher than the increased farm income that would be received from such a program, and there also is the issue of whether a mandatory program could, in fact, be really implemented. Would we be able to get farmers to agree to it unless it was legislated? If it was referendum determined, it might be difficult to get farmers to agree to the concept.

The CHAIRMAN. We have a hard choice, whichever way we go. I was noticing that North Carolina is not on any of the lists you gave, and I was pleased to see that. A lot of States have restrictive laws with respect to agriculture.

If you have any opinion on it, what has been the implication of that? I think I noticed that the States that do have such laws, restrictive laws, are the ones that have the most distress right now.

Is there any corollary there or am I just seeing things? Any of the three of you.

Dr. MELICHAR. Do you refer to such things as laws restricting the ownership of farmland?

The CHAIRMAN. Yes.

Dr. MELICHAR. By corporations?

The CHAIRMAN. Yes, sir.

Dr. MELICHAR. I would think this would have a very limited impact.

The CHAIRMAN. So it is just coincidental?

Dr. MELICHAR. Yes. I think so. Studies I have done show that land prices react to farm income. In other words, the land market sets the rate of profitability of farming that the people involved in the business of buying and selling farmland are, in a sense, seeking as they look at alternative investments and work. And if farm profitability is lower than alternative returns, that has an effect on the land market. And that sort of sums up what has happened starting in 1980.

The CHAIRMAN. Everybody agree to that?

Dr. BOEHLJE. Let me just comment about this.

Iowa has restrictions on nonresident alien ownership of farmland and also corporate ownership of farmland. There have been arguments made that those restrictions in Iowa and other States who have similar types of restrictions, are highly correlated with declining land values. I have not seen a definitive study that really documents that at all. That is kind of an assumption rather than analytical results.

As a matter of fact, I think probably if you eyeballed the information, you will find that the declines are correlated as Emanuel said, with underlying economic forces more than with that issue.

One other dimension. Some of these laws are not quite as restrictive as perceived.

For example, we have in the Iowa Legislature a significant debate on whether we should change the ownership rules and make them less restrictive. A presumption of some of those wanting to do that is there are a lot of people sitting on the border ready to come in. Our assessment is that is not the case. In fact, in Iowa the law does allow outside investors. It just restricts the corporate entity and the nonresident alien, but you can, in various other fashions, become an outside investor in agriculture.

The CHAIRMAN. That has been our experience in North Carolina. I had letters some few years ago from people down there who were willing to take a paralyzed oath that the whole thing was going to pot, that we would have Arabs and everybody else owning the State.

What is the figure? What is the percentage of the so-called alien ownership?

Mr. DUNLOP. Less than one-tenth of 1 percent.

The CHAIRMAN. So we have had the same thing. I have seen that I have gone 11 minutes.

Senator Melcher.

Senator MELCHER. The chairman stated, and I guess it is correct, and I will ask him, at the outset you stated 15 percent of the loans were by the Farmers Home Administration. I assume that 15 percent of all agricultural loans in the United States were those of the Farmers Home Administration.

Mr. DUNLOP. That would be all non-real-estate loans, that is operating loans.

Senator MELCHER. Dr. Melichar, you said 4 percent of all bank loans were for agriculture, is that correct?

Dr. MELICHAR. Four percent of the total loans in the banking system are agricultural loans, $50 billion of agricultural loans and about $1,260 billion total loans.

Senator MELCHER. If 15 percent of agriculture operating loans are held by the Farmers Home Administration, then the question is how healthy are the other 85 percent? If they are bank loans and they go bad, will the Federal Reserve Board move in and repeat the process with Continental-Illinios and open the window and give 8½-percent money for 5 years?

Dr. **Melichar**. No, that would not be correct. The Federal Reserve really has no role or tool to cope with bad loans.

Senator **Melcher**. Was Rowan's reporting wrong in quoting the data released by the Federal Reserve Board that says that the Federal Reserve Board stepped in with $3.5 billion worth of 8½-percent money, or whatever the Treasury rates were, for 5 years for Continental-Illinois?

Dr. **Melichar**. Continental borrowed from the Federal Reserve and also from a group of other banks.

Continental appeared to have a problem with bad loans. As rumors of this got around, the depositors in Continental, many of which were abroad—particularly ones abroad—started to not renew their certificates of deposit.

Senator **Melcher**. Is Rowan's article true, that $3½ billion worth was provided by the Federal Reserve Board at whatever the Treasury rates were, which is now around 8½ percent, for 5 years to Continental?

Dr. **Melichar**. The Federal Reserve credit was "extended borrowing" which would be above the discount rate, probably a percentage point or more above the discount rate.

Senator **Melcher**. Nine and one-half percent, is that right?

Dr. **Melichar**. At the present time, the discount rate is 8 percent, and extended borrowing probably would be 9 percent or more.

Senator **Melcher**. But it is true?

Dr. **Melichar**. Money was not provided to rescue any bad loans. If the loans are bad——

Senator **Melcher**. You rescued the bank?

Dr. **Melichar**. The capital of the bank may be completely lost and the stockholders may lose everything if, in fact, the loans are bad.

Senator **Melcher**. I am not quibbling. I am asking if it is true? The Federal Reserve can do that? You can do that for these banks here?

Dr. **Melichar**. If the problem is a Continental type problem, and there is a run on deposits——

Senator **Melcher**. If it is big enough.

Dr. **Melichar**. If it is a run on deposits, then I am sure we would do it.

Senator **Melcher**. What about this Iowa bank? Was this not a run on deposits?

Dr. **Melichar**. I am not aware of any bank that closed in rural areas where the problem has been that the depositors are withdrawing their money.

Senator **Melcher**. I think, with all due respect, this is a little bit of a quibble. Continental was failing, and these little banks are failing. I am just saying that the Federal Reserve has the option to step in in the same way they did with Continental.

Dr. **Melichar**. I believe I appreciate your point, but in the Continental case it was not clear at the time that the Federal Reserve stepped in that, in fact, the bad loans were as large as they were, that they may, in fact, equal the capital. However, even that is not known yet. The bad loans may not be equal to capital. The stockholders may recover something.

Senator **MELCHER**. I am not criticizing the Fed for doing that, but I suspect because there is only 4 percent of the loans that you tabulate that are agriculture, you are saying, in effect, it is a small problem nationwide, but Continental was a big problem.

Dr. **MELICHAR**. That is true. Continental had ramifications—the deposits of other banks in Continental, and so on.

Senator **MELCHER**. If next week they do it for Bowery, that will be a bigger problem because that is about $17 billion for Bowery.

Dr. **MELICHAR**. I am not familiar with that.

Senator **MELCHER**. The savings and loan in New York City that is in bad shape.

Dr. **MELICHAR**. I am not familiar with that at all.

Senator **MELCHER**. I will skip that one.

Dr. **MELICHAR**. In fact, I am strictly an agricultural finance specialist.

Senator **MELCHER**. You are not recommending they step in, that the Fed step in?

Dr. **MELICHAR**. If the problem is one of liquidity, then, yes, the Fed would step in.

Senator **MELCHER**. Then we have got the PCA's. Three went broke in my State, as you know.

One of the things that, of course, is missing is 15 percent of this money is protected. Fifteen percent of these borrowers, if you call that protection, have got the Farmers Home to jawbone. I suspect about 30 percent of the operating loans for farmers are carried by the farm credit system. Is that right?

Dr. **IRWIN**. The PCA's have just about 10 percent of the total agricultural debt, and that is less than half the real estate debts, so you have got close to 20 percent.

Senator **MELCHER**. 20 percent.

In my State, it is closer to 50 percent. It is pretty difficult to get a handle on how serious this situation is. At least I gleaned out of all three of your statements that it may be getting worse.

I brought up this point of what about these combines, trucks, tractors that are not financed through the bank. I would like to know how you do it in the PCA.

Dr. **IRWIN**. The USDA figures show $18.2 billion on non-real-estate debt to individuals and others compared to a very similar amount with the PCA's so it is a very big number that individuals and others provide.

Senator **MELCHER**. I could not say the Department of Agriculture is in such good shape through their agricultural statistics to make that guess, but nevertheless the problem is getting worse, so the real question is what to do about it.

I take it, Dr. Boehlje, when you are referring to some of these proposals that want a market-oriented type of procedure to follow over the next 5, 6, 7 years, you are referring directly to the administration bill, is that correct?

Dr. **BOEHLJE**. That analysis was basically as close at the time we did it, which was about a month ago, to what we thought the administration bill would look like.

We are now updating it with a second analysis which, quite frankly, because of the deterioration in the financial condition, will show even more serious problems.

Senator MELCHER. It is a dead bill any way, and we can quit worrying about it, and go on to other things.

This is beyond your testimony, but I suspect what we really want is a farm bill that deals with a world trade orientation, not market orientation, but world trade orientation. How do we compete with countries that block out our sales, such as Japan, and with whom we run a $38 billion deficit? How do we deal with countries on the other side of the spectrum, like Mexico, where we ought to be, with 82 million people, three times what there is in Canada? How do we secure a growing market down there? How do we deal, if we want to look to the north, with a strong dollar, where Canada has a 30 percent advantage of sending us whatever?

Hogs is the latest thing we have been looking at. It seems like we are going to be eating a lot of Canadian ham, bacon, and pork chops.

These are all three separate problems on the trade aspect. I am not trying to simplify it, because it is not simple. But, there are three aspects we must address; some sort of reciprocity with cash customers; some sort of agreement with those countries, such as Mexico, who have currenly no kind of an economy to buy the food they need for their people; and thirdly, what do we do about the strong dollar, and have some readjustments with those countries that are good trading partners, such as Canada.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, John.

Gentlemen, let me apologize. I did not make clear at the outset that we invited you to come as expert witnesses, not to represent the policies or positions, or defend them. So I know the Senators understand that, but let me say that for the record.

Senator MELCHER. Oh, well, the guy from Agriculture can defend himself, and this guy is going to have to defend the farm credit system, and everybody can defend the Federal Reserve Board, Dr. Melichar knows that.

By the way, I thought it was a good thing, to bail out Continental. [Laughter.]

I approved of it.

The CHAIRMAN. I will put in the record that for a veterinarian, he is a darn good prosecutor, is he not? [Laughter.]

Senator Zorinsky.

STATEMENT OF HON. EDWARD ZORINSKY, A U.S. SENATOR FROM NEBRASKA

Senator ZORINSKY. Mr. Chairman, America's family farmers are fighting for their economic survival. According to the Department of Agriculture, about 378,000 farmers have debt-to-asset ratios that indicate severe financial stress. This farm credit crisis is a tragedy of staggering proportions and the administration's response has been inadequate.

Last fall—just before the election—the administration announced a "Debt Adjustment" Program designed to help farmers reeling from low prices, high interest rates and record crop surpluses. At that time, we were told that this was a workable program and many from farm States hailed the administration's plan as the answer to their prayers.

A few weeks ago, after much criticism of that program, the administration announced some relatively minor changes in the Debt Adjustment Program. We were told that those changes would make for a workable program. When the President vetoed the emergency farm credit legislation approved by Congress, we were told that it wasn't needed because a workable program was in place.

However, there is much evidence that the current Emergency Credit Assistance Program is not workable and that the minor changes made by the administration will not make it workable.

For example, of the 106,000 applications from current Farmers Home Administration borrowers for assistance under the Debt Adjustment Program, only about 21,000 have received any assistance as of March 14.

The reason for this is not that farmers delayed filing their applications—the program allowed farmers only 30 days to file an application. Those applications have been piled high on desks in county offices all over the country for months.

In terms of loan guarantees issued under the Debt Adjustement Program, as of March 14, only 61 loans have been guaranteed.

That is not my definition of a workable program.

I think the record I have just outlined demonstrates that Washington is not willing to treat our Nation's farmers as well as it treats multinational corporations and foreign nations.

Through this hearing, I hope we can learn what the credit crisis will lead to if Congress and the administration fail to enact a farm bill that will make it possible for farmers to make a profit. If we fail to enact such a bill, I believe the consequences could be most harsh—not only for farmers—but also for our financial system and the entire economy.

I look forward to reviewing the testimony of today's witnesses and I ask that the Department of Agriculture report referred to in my statement be made part of the hearing record.[1]

The CHAIRMAN. Thank you Senator Zorinsky.

Senator ZORINSKY. Dr. Irwin, I introduced legislation that would give the Farm Credit Administration greater regulatory authority. I introduced this legislation to provide greater protection for the borrowers and the investors of the farm credit system.

As you know, the Federal Government does not guarantee farm credit system securities, and unlike many other financial institutions, there is no applicable Federal or State insurance programs.

Given those facts, it seems to me that the Farm Credit Administration, which you represent, is really on the front line in the area of protecting the interest of the system's borrowers and investors.

I have several questions that I will submit for the record, but for now would you comment on how this legislation will affect the regulation of the system, and do you feel it is needed?

Dr. IRWIN. Well, without apologizing for the regulatory job that we have been doing so far, which I do not think is so bad, conditions in the future are changing, and that is the primary justification that one would make for seeking a different kind of power.

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[1] See p. 245 for the report referred to by Senator Zorinsky.

The current authorities of the FCA are either in the nature of injecting ourselves as a regulator into the business decisions of the bank or association, by putting on prior approval restriction, or approving loans, approving policies, looking over the shoulder, or they are in the other direction sledgehammer powers. You can deny a bank access to the bond market, you can disapprove the salary a board proposes to pay its chief executive, you can require a merger when a situation is really bad, or you can declare an institution insolvent. They are all very catastrophic type actions FCA can take.

So as a practical matter, in between, if one does not want to inject himself into the business decisions, then what he does is regulate by persuasion. We think the kind of economic volatility that we are seeing now, and expect to see in the future, makes this time-consuming process of persuasion just not adequate to assure a viable system.

We have been, ever since the 1971 Farm Credit Act, in a process of having authority at the lowest, or most local possible level, and that has been carried to quite great length.

If one carries such delegation much further than we are now, you need some kind of accountability and control that let you intervene whenever there is something unsafe or unsound or illegal. That is the basis for the kind of proposal that you are making.

Senator ZORINSKY. Thank you.

Dr. Melichar, in my State of Nebraska we have had several bank failures due to problem farm loans. I understand that there are about 4,000 banks that have portfolios consisting of 25 percent or more in farm loans.

How would our financial system be affected if 10 percent, or 400 of those banks failed in the next 2 years? Would the system be able to absorb that type of loss?

Dr. MELICHAR. Well, that would not be pleasant, and I do not want to imply, by what I say next, that I want to make little of what would be a bad situation. That number of failures according to the data I presented, does not appear to be in prospect within the next year or two.

I identified, in my statement, 210 banks now in the group from which most bank failures have come in the past, and that was up from 162 a year earlier. And, not quite half of these are agricultural banks. So I do not think we are approaching the dimension that you outline.

However, having said that, the 4,000 banks at which farm loans are 25 percent or more of total loans have total assets that altogether do not equal those of CitiBank, and are approximately equal to those of the Bank of America. All 4,000 together are equal to one major money-center bank—about $100 billion in assets, $80 billion in deposits, $50 to $60 billion in loans.

You are hypothesizing a failure of one-tenth of them, or in effect, of an institution that would have about $10 billion in assets—a major regional bank outside of New York, that sort of thing. That is obviously not big enough to threaten the viability of the banking system, but clearly——

Senator Zorinsky. How large was Continental-Illinois?

Dr. Melichar. I think Continental was in the area of $30 to $40 billion in assets, if I am not mistaken.

Senator Zorinsky. About three times the cumulative assets of 400 small banks.

Dr. Melichar. Perhaps I should have prefaced my response to Senator Melcher by saying that my total information on Continental-Illinois is obtained by reading the Wall Street Journal and the Washington Post. I am not involved in that sort of thing in my work at the Federal Reserve.

Senator Zorinsky. Thank you very much, Mr. Chairman.

The Chairman. Thank you, Senator.

I have got two or three questions that I would like any or all of you to address, in particular, whether my information is correct.

The USDA says that two-thirds of all the family-sized commercial farms—and they define that as being between $50,000 and $500,000 in gross sales—have no apparent financial stress.

Now, does anybody dispute that figure? Do you think that is reasonably accurate?

Dr. Irwin. Yes.

Dr. Melichar. It is accurate, given the information we have now. I am rather distressed that most of such estimates have relied upon hypothesizing, or logically deducing, the effects on income and on finance resulting from debt—asset ratios when, in fact, there are data, both available and onstream, that look directly at the bottom line: What is the income result, what income do you have before you pay the interest, what is left after paying interest?

The two-thirds figure is based on reasoning that if a farmer's debt is greater than a certain percentage of assets, such as 40 percent, then the difference between the interest rate and the rate of return on capital is large enough, at that level of debt, to give the farmer a financial problem.

And yet, scattered information on farmers' income indicate that, if the farmer is in an area where he has had drought one or more years, he can have a financial problem with little or no debt, and conversely, if he is producing some specialties that are very profitable, or where sales are large relative to assets, such as in the poultry industry, the farmer can have a high debt level and still be operating profitably.

The Chairman. Are you assuming participation in the crop insurance, or not, when you talk about disasters?

Dr. Melichar. Well, if you participate in crop insurance, that would help, but——

The Chairman. But that would affect your answer, and that would affect the figures?

Dr. Melichar. Sure.

The Chairman. That is an unknown factor.

Dr. Melichar. There are a number of factors like that that could have an influence on the financial result, other than the level of debt, and that is my point.

The Chairman. Right. Well, what is, if you have an opinion about it, the debt-asset-ratio level, the line, demarcation, with respect to profitability? Did you say 30 percent?

Dr. **Melichar**. Well, two popular threshold levels are being used. I continually read that people with over 70 percent debt-asset ratios are as good as gone, or something to that effect, and yet it is known that some of them are operating profitably. So that is not quite true.

And the other level is 40 percent. I fear that in the work I did over a year ago, I probably was responsible for setting both of those levels. I think I was the first to choose those levels, and if you knew how I chose them, in the middle of the night, in making a balanced and concise table for my publication, you would have some qualms about accepting them as absolute thresholds of financial stress, and that is what I was trying to indicate in my comment a minute ago.

The **Chairman**. It sounds like the way some of us write legislation around this place, in the middle of the night.

Dr. **Boehlje**. Let me note that if you choose that as the only criteria——

The **Chairman**. Which is that, 30 or 40?

Dr. **Boehlje**. If you choose the debt-to-asset ratio as the only measurement——

The **Chairman**. I am not choosing that as the only measurement.

Dr. **Boehlje**. I am saying if that were the case, our farm management studies on individual farms do, in fact, correlate very closely with the 70 percent and above being where a farmer cannot make his principal and interest payments, and at 40 to 70 percent, a farmer is encountering problems making full principal and interest payments.

So there is more than just Emanuel's middle of the night determination to that set of numbers. They are, in fact, consistent with other studies that we have done on individual farms.

The **Chairman**. I recognize this is sort of a nebulous question, but I do not know how to ask it in any other way.

Let us take farms, farmers who have 40 percent or greater. Suppose the Government, meaning this committee, and the Senate and the House of Representatives, and the President, decided to keep all farmers in business who have a debt-asset ratio of 40 percent or more, how much would that cost the taxpayers?

Have you got any idea, any studies producing anything on that?

Dr. **Irwin**. No.

The **Chairman**. Could I ask you, to think about it and give me a memorandum on it, just what your guess might be?

Dr. **Melichar**. I have written something along those lines. The numbers, especially as they started back a couple of years ago, before land values fell, were truly frightening. Farm assets then were about $1 trillion.

If you figured that in the long run such assets must earn, let us say, 6 percent, then net farm income must be $60 billion a year in order to keep in existence $1,000 billion of asset values. And I wrote a lot about the debt-asset ratio because I felt that since 1980 it probably has been the No. 1 influence on farmers' financial status. Simply put, if farmers are making about 2, 3, or 4 percent return on their capital while paying interest of 12, 13, 14, or 15 percent, whether they are financially stressed becomes a matter of arithmetic. If the debt-asset ratio is high enough, interest charges exceed earnings on the high capital values.

The **Chairman**. You say $60 billion. Let the record show I whispered $60 billion.

Dr. **Melichar**. That is to yield a return of 6 percent. It was not producing 6 percent. It was not producing $60 billion, and it did not stay in existence.

In other words, the land values are declining, which is the land market's way of restoring profitability to agriculture.

The **Chairman**. One of my erudite staff members has given me a question I do not understand. [Laughter.]

You state the question.

Mr. **Brooks**. Does that include the return for the land, as well as other assets, the 6 percent?

Dr. **Melichar**. Yes. But I just picked 6 percent as a hypothetical number. You could make your case much more frightening by saying that if Government bond yields stay at 11 percent, and over time yields on farmland must be competitive with yields on Government bonds, then $110 billion a year would be required to keep——

The **Chairman**. I am going to lunch if you keep on escalating figures.

Dr. **Melichar**. I do not want to overstate that. Obviously, I do not think these high interest rates are going to be with us in the long term, so maybe I should not have brought that up.

Senator **Zorinsky**. Mr. Chairman, would you yield?

The **Chairman**. Certainly.

Senator **Zorinsky**. Is it true—take a look at the debt-to-farm income ratio. Is it not true that since 1931 the debt-to-income ratio has increased by 17 times, approximately?

In 1931, if I remember correctly, for every dollar of income there was 70 cents in debt, and today it is turned around, where I think there is an excess of $11 in debt for every dollar of income.

As a matter of fact, last year the interest alone that farmers were subject to was $20 billion, and net income was short of that by $6 billion.

Are these figures that you are familiar with?

Dr. **Irwin**. I am not familiar with the 17 times number. I think you also have to recognize that net farm income is after interest payments, the $14 billion, so it is true if interest did not exist, you would have added $20 billion to net farm income, but you would have added it to the $14 billion you had already.

There is also the same kind of a problem you were discussing on this debt-asset ratio. The relevance of nonfarm income in servicing debt varies across the country, and by size of farm, and by type of farm. A portion of debt is not really related to farm income at all.

Senator **Zorinsky**. Thank you.

Thank you, Mr. Chairman.

The **Chairman**. You break in any time, because there are just the two of us here.

I am just fascinated by what you are saying.

Dr. Boehlje, you mentioned an interest rate buydown, a very interesting suggestion. Have you got any estimate of what that would cost?

Dr. BOEHLJE. Well, as we indicated earlier, we estimate that the lending community will be about $2.2 billion short in receiving their scheduled interest payments this year, $2.2 billion. And so, if you wanted to make the agricultural sector cash flow, not repaying principal, but at least making sure the interest obligations are paid, then you would be thinking of $2.2 billion.

The proposals that have been typically suggested for interest rate buydowns have had a sharing of that cost between the lender, or either a State or Federal agency.

So what we are really saying is that the lenders will not get $2.2 billion. They are going to have that kind of loss, and the question is, Are we going to have them proceed ahead on those that do not repay and foreclose, or will we develop some systems that will keep that debt in performing status?

If there was a 50 percent sharing of that cost on the part of the Federal Government, then that would cost approximately, according to our estimates, about $1 billion. In other words, the lender takes half of it in terms of lower returns and yields, and the Federal or State agency takes the other half.

The CHAIRMAN. You are talking about all farmers who are in distress?

Dr. BOEHLJE. That is right. That would basically be if a buydown were applied to all farmers in distress. We were not suggesting an interest rate buydown for all farmers. There would have to be some nonperformance criteria before they qualified.

The CHAIRMAN. I see another march on Washington, wherever you draw the line.

Then you also mentioned establishing an entity to acquire the nonperforming debt from agricultural lenders. What kind of capitalization are you talking about?

Dr. BOEHLJE. That is an interesting issue, in terms of how you would proceed. There are two alternatives that might be implemented there.

One would require a significant amount of capital, and the other not quite so much.

Let me just explain briefly. One procedure would be to have a new entity formed, that basically buys out the lender.

In other words, if a lender has assets that are nonperforming, the lender would transfer those assets to this entity, and transfer the security along with that. The entity takes over completely, and provides the cash to the lender, and buys him out completely.

The new entity then becomes an owner of the assets, and the debt on that is serviced to that new entity, rather than to the original lender. That would take a significant, sizable capital outlay up front to get it done.

The CHAIRMAN. Like what?

Dr. BOEHLJE. It depends on how many acres might be involved. If it was a land purchasing entity, we might be talking about $5, $7, $10 billion, maybe even more.

On the other hand, an alternative is to basically have the entity not buy out the lender but advance funds to the lender in the amount needed to maintain the interest payments on the loan.

The **Chairman**. Tell me how this would work. The lender of record transfers. Does he just give the paper to this entity that you are proposing?

Dr. **Boehlje**. He is going to obtain part of the interest on the debt obligation from this entity.

The **Chairman**. I understand that.

Dr. **Boehlje**. He is going to transfer the security associated with it so he essentially gives up part of the security.

The **Chairman**. So he gets nothing for it?

Dr. **Boehlje**. He gets out from under a State debt. The concept here would be to basically separate out the State debt, nonperforming debt, from the performing debt and provide new funds for new loan obligations. In other words, you are basically saying there is some debt that is not performing, let us set it aside, let somebody else take responsibility for that, and we then will allow that lender to go about the business of working with its performing debt and to make new loans rather than being under the crunch of trying to work with all that State debt that is nonperforming.

The **Chairman**. That would be the entity that you say would cost $7 to $10 billion up front money?

Dr. **Boehlje**. If we were to just keep interest payments current we might be able to do that for as little as $2 to $3 million.

The **Chairman**. So we have anywhere between $4.2 and $5.2 billion between the two proposals you have made.

Senator **Zorinsky**. Where do these entities get their operating capital?

The **Chairman**. Uncle Sam.

Dr. **Boehlje**. Let me elaborate a second on that because the question was the up front capital to get it started. Once that entity is in place, there is still going to be a problem of a difference between its earnings and the cost of the money. We think whether that stays with the current lending community or goes into a new lending entity it is still going to be about $2 billion. So basically you have got an annual subsidy that is going to have to go somewhere to hold that property and that is not going to be all that different unless the new entity can raise money a heck of a lot cheaper than the current entity does. You may have a narrower subsidy in that situation.

The **Chairman**. I am not going to keep you here a lot longer, but there are two or three points I want to understand in my own mind. This farm crisis sort of hits me where I live. Both my parents came off the farm, and it was tough at best. Of course, back in that day it was tougher for everybody. But when the Government extends more and more credit to the most risky borrowers through the Farmers Home Administration, does it strengthen or weaken the overall agricultural economy? Are you going to punt on that one?

Dr. **Boehlje**. Well, I think that if that credit is for new entrants into the sector, to repopulate the sector, then you have one type of implication. Part of the original justification for the Farmers Home Administration and other Government credit was to assist beginning farmers, and much of it was credit to assist in times of unexpected adversity. Those types of credits in my judgment do strengthen the economy.

If, on the other hand, the credit is extended for farmers to keep them there, but we know they are going to exit the industry because of nonperformance, because of bad management, et cetera, then it seems to me that there may be a shortrun benefit of keeping those assets off the market, but in the long run those farmers should be phased out.

I think we need to be somewhat concerned and careful about public sector extension of credit because the very rapid growth in public sector extension of credit to agriculture occurred during the 1970's when agriculture in general was not under severe economic stress. In other words, we extended credit exactly at a time when, in fact, maybe we did not need it.

The **Chairman**. Let us take this hypothetical. If a guaranteed loan program would not work because of a lender's lack of cooperation—and we have a lot of that, let us face it. A lot of these farm banks are not eleemosynary institutions. What would be the cost for the Government to make all farm loans, all of them, to borrowers who have difficulty receiving credit from the private sector? You want to tackle that one?

Dr. **Irwin**. Under what terms? Are you going to lend to anybody who wants to be a farmer and does not have any basis for credit?

The **Chairman**. Let us just start with existing farmers who are in distress.

Dr. **Irwin**. If a third of farm debt's roughly carries over 70 percent debt-asset ratio—you can say those all are nonviable. Eventually I could transfer that entire package into such a program. I do not think anyone has even seriously looked at that because the cost would be enormous. It is generally accepted professionally that there have to be some losses. Those asset values are going to be adjusted and there are losses to be assumed.

Dr. **Boehlje**. Just back of the envelope numbers, if we say that 25 percent of the debt in agriculture is nonperforming, that is about $50 billion. The Farmers Home Administration, George, has how much already? What I am looking at is the difference between $50 billion and what Farmers Home currently has which is $25 billion, so it would be about $25 billion being transferred.

The **Chairman**. That is exactly what I am looking at, the reason I ask the question is not because anybody is proposing that. You know I have got more sense than that. Nobody, not you and not seriously in the Senate, I hope, but I think that a lot of the public does not understand the enormity of what is going on in terms of various recommendations and requests. But it boggles the mind to try to evaluate some of the proposals that people come to me with and say this will work. I was at a dinner the other night and I had a gentleman sitting next to me, and he had it all worked out. He said, "I have got your farm bill for you." And I started to ask him questions about how much would this cost. He did not know, but we took his estimates and I think we ended up with a farm bill that would cost $31 billion. If I had $31 billion I could solve anything in a financial crunch.

But the truth of the matter is we do not. We have a right sizable deficit which is pulling at the heart strings of the American people.

I will close out with this one. You know, the most common complaint I get from farmers in North Carolina about the Federal farm lending policies is that they have to compete with the producers who are seeking credit at a low interest rate from the Farmers Home Administration. Now, my question is to what degree in the judgment of the three of you are the 83 percent of farmers who do not borrow from the Farmers Home Administration at an economic disadvantage because of the easy credit policy?

Dr. IRWIN. I think what they are talking about is a theory that if those people were not farming that land, somehow no production would take place. I sort of doubt if that is true. It seems more likely that Farmers Home borrowers are among the least efficient; and if you eliminate Farmers Home, somebody would take over most of the assets and produce even more. But of course it is true that if you would get the asset, if the land would go out of production by eliminating Farmers Home borrowers, and then everybody else would be better off.

The CHAIRMAN. Any further comment on any aspect of what we have discussed this morning?

[No response.]

The CHAIRMAN. Let me say again that I know that you gentlemen made a sacrifice of your time to come here after having sacrificed your time in preparation, and I want you to know we appreciate it and it has not been an idle exercise. This is the only way that I, for one, can learn a little something about what we are trying to do, and I just want you to know I am deeply grateful to you.

If there is no further business to come before the committee, we will adjourn.

[Whereupon, at 12:25 p.m., the committee recessed, to reconvene **at 9 a.m., Wednesday, May 1, 1985, in room 328-A, Russell Senate Office Building.]**

FRAMEWORK AND ANALYSIS FOR AGRICULTURAL POLICY IN 1985

Critical Analysis of Agricultural Policy Options

WEDNESDAY, MAY 1, 1985

U.S. SENATE,
COMMITTEE ON AGRICULTURE, NUTRITION, AND FORESTRY,
Washington, DC.

The committee met, pursuant to notice, at 9:07 a.m., in room SR-328A, Russell Senate Office Building, Hon. Jesse Helms (chairman of the committee) presiding.

Present: Senators Helms, Boschwitz, Zorinsky, Leahy, Dixon, and Harkin.

STATEMENT OF HON. JESSE HELMS, A U.S. SENATOR FROM NORTH CAROLINA

The Chairman. The committee will come to order.

This is the last hearing in a series of what the staff has chosen to call thematic hearings. I decided to ask the staff a while ago: "What do you mean by 'thematic'?" and they gave me an explanation, and I am not sure I understand yet, but anyway, we will find out.

In the first four hearings, we covered the structure of agriculture, loan rates, target prices, production controls and supply management, research and technology, and credit, debt, and investment in agriculture.

Just for the record, since the last, or the most recent thematic hearing on March 20, the committee has held 13 hearings on the farm bill at the full committee level, the purpose of which has been to hear from farmers, taxpayers, farm groups, Members of Congress, and others who wanted to comment on the farm bill. In addition, members of this committee have conducted field hearings in various parts of the country, and I trust that everyone has been offered an opportunity to testify, and that all have done so, or submitted written testimony for the record, or both.

The purpose of the hearing this morning is to consider what has been covered thus far, and to see if we have reached any conclusions about these areas that members of the committee should consider as we begin the markup on the farm bill next week.

As we approach the markup, the committee has before it a number of bills which differ in certain aspects of their approach. All of these bills provide for the continuation of loan rates, although with different variations.

Almost all of these bills provide that loan rates would be set in relation to an average market price and would be lower than present loan rates, and several bills retain the current target price mechanism; one uses a marketing loan, and another uses transition payments and so forth.

In the interest of time—this is a beautiful, eloquent statement, tastefully prepared—but I am going to ask unanimous consent that it be printed in the record.[1]

Without objection, it is so ordered.

We will now hear from the distinguished ranking Democrat on the committee, Senator Zorinsky.

STATEMENT OF HON. EDWARD ZORINSKY, A U.S. SENATOR FROM NEBRASKA

Senator Zorinsky. Thank you, Mr. Chairman.

Today's hearing will be the last in a series of hearings on the issues that must be addressed by the 1985 farm bill. As early as next week, the committee may begin markup on the various farm bills that have been introduced. During the hearing process, witnesses representing a wide variety of interests presented testimony on the commodity programs, soil and water resource conservation, rural credit, research and technology, and other issues that are of vital importance to America's farmers.

Shortly, I will be introducing my version of the 1985 farm bill. That bill is the product of many hours of work and careful study of the suggestions and comments made during the farm bill hearings, including two field hearings that I conducted in the State of Nebraska.

Mr. Chairman, in the essence of time, I ask unanimous consent that my statement be placed in the record.[2]

The Chairman. Without objection, so ordered.

Senator Zorinsky. Thank you, Mr. Chairman.

The Chairman. Senator Zorinsky and I enjoy a good relationship on this committee. I enjoy his sense of humor. I heard him say the other day that somebody described him as a "model Senator." He was so proud of that, until he looked up the word "model"—and what does "model" mean?

Senator Zorinsky. "Model" means "a small imitation of the real thing." [Laughter.]

The Chairman. We will be completely informal this morning, and you have the choice of presenting your prepared statement or having all of it or part of it put in the record, or whatever. We may even break in from time to time and ask you questions.

I want to express the appreciation of the committee for the time and effort that you have devoted in preparing to come here this morning and for coming. I know there are other things that each of you could have been doing this morning, but you chose to help us out, and I appreciate it.

We have Dr. D. Gale Johnson of the department of economics of the University of Chicago; Dr. Marvin Duncan, vice president and economist, with the Federal Reserve Bank of Kansas City, and

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[1] See p. 279 for the prepared statement of Senator Helms.

[2] See p. 280 for the prepared statement of Senator Zorinsky.

John A. Schnittker, president of Schnittker Associates of Washington, DC.

Please proceed in any order, gentlemen.

STATEMENT OF JOHN A. SCHNITTKER, PRESIDENT, SCHNITTKER ASSOCIATES

Mr. SCHNITTKER. Thank you, Mr. Chairman.

I want to thank you for the invitation to appear, to comment on the farm bill proposals in the context of the very difficult situation American farmers are in for the next few years.

I have set down what I consider to be a fairly practical course of action for the principal commodities, consistent with testimony that has been given, bills introduced, the needs of the farm sector, and the Federal budget, which also must be accounted for.

I am going to paraphrase my remarks and ask that my formal statement be included in the record.[1]

The CHAIRMAN. Without objection.

Mr. SCHNITTKER. Thank you.

I will address my remarks to half a dozen key issues that come up almost entirely in the commodity price support and production adjustment sectors of the bill.

On the question of price support loans and the U.S. competitive position abroad, it is my judgment that in the 1985 act, it is essential that loan rates be reduced, beginning with the 1986 crops, to give our growers a better chance in the export markets.

Language in the 1981 act authorized that this could be done, 10 percent a year. Secretary Block used it once for wheat, but passed up the opportunity to use it a number of times, because it is optional. Congress probably ought to require some loan rate reduction in the interest of a better competitive position beginning next year.

I think the so-called soybean formula, which Senator Helms referred to, or a formula setting future loan rates as a percentage of past average market prices, is a good place to start, and there are a number of versions of that before this committee in various bills.

I think it might be found that the formula applied to wheat, corn, cotton or rice may reduce loan levels more sharply than Congress wishes to do, particularly in the first year, and that the Congress may wish to set some minimum loan levels for the first few years. I have made some suggestions in my testimony of minimum loan levels for principal commodities, which would help in foreign markets, would also be consistent with what I am guessing and judging will be the eventual outcome of the debate on budget policy.

On the question of target price payments and costs, I judge that there is literally no possibility that the CCC budget can be cut by a few billion dollars for 1987 or 1988, if present law or current services, as the CBO calls it, would be continued. Therefore, I believe that not only loan levels, but probably target price levels, would have to be reduced somewhat consistent with budget policy. Starting from the draft budget resolution presently being debated by the Senate, I have set down in my testimony some round number target price levels which I judge to be consistent with a probable outcome of the budget debate, without prejudging exactly what is going to happen.

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[1] See p. 280 for the prepared statement of Mr. Schnittker.

The question of limiting payments, I believe, is an important one. I have supported limiting payments to big farmers for 20 years, both when I was in the Government and since I have been out. I think the formula in Senator Helms' bill, for example, provides a reasonable payment limit starting in 1986, and that large farmers generally have access to low cost inputs and highly productive technologies, and will get along just fine if payments are limited to the area of $25,000 or so per farm.

On the question of set-aside or acreage reduction, I know that a number of proposals have come before the committee that this ought to be ended summarily, beginning with 1986 crops. In my judgment, with the surplus capacity to produce commodities that we now have, and stored surpluses as well, the set-aside or acreage reduction features of the commodity programs should be retained for several years, despite their increasing ineffectiveness. As long as target price or other direct payments to farmers are continued, these payments are either going to serve as an incentive to increase output, when we already have surpluses, or if we have set-aside percentages, those payments can serve as an incentive for the farmers to lay aside some of their land and at least hold production back a little bit. Therefore, I believe that this feature of the program ought to be continued as long as we have target price or other direct payments.

On the other hand, the so-called paid diversion feature of wheat, corn, cotton and rice programs, which served a useful purpose for some 20 years in this Government, is now obsolete, in my judgment. It once saved money, compared with further production of surpluses; now it costs money. We have excessively high payment rates, inflated base acreages, and a combination of loopholes and loose administration by USDA that have destroyed the effectiveness of paid diversion, and I think it should be terminated.

Sugar, tobacco, and peanuts are in a somewhat different game than wheat, corn, cotton, and rice. At the same time, I judge that equity consideration and consistency in trade and regulatory policy require that for these commodities, at least in 1986, support levels ought not to be increased and should be capped. Over time, support levels for these commodities could possibly be brought down a little, if the major crop support levels are brought down, in the interest of both consistency and equity.

Finally, on trade expansion features, there are a number of trade expansion features in various bills before this committee. I fear that these proposals, especially for export PIK and bonus bushels and similar approaches to sporadic export subsidies, will not go very far to reestablishing the U.S. trade position as compared with, for example, continuation of export credits, expansion of that program, and especially, reducing loan rates and getting the dollar's value down.

I think there is also the risk that use of present surpluses to expand export pushes those surpluses back into the market and can have a price-depressing effect, as well.

Finally, in my prepared testimony, I have a few words on the farm credit situation, but since Dr. Duncan is one of the leading experts on this, I am going to pass that for the moment and put it in the written testimony.

Thank you.

The CHAIRMAN. Thank you very much.

Dr. Duncan.

STATEMENT OF DR. MARVIN DUNCAN, VICE PRESIDENT AND ECONOMIST, FEDERAL RESERVE BANK OF KANSAS CITY, KANSAS CITY, MO

Dr. DUNCAN. Mr. Chairman and distinguished members of the committee, I am pleased to be with you this morning to discuss the 1985 farm legislation considerations.

I am going to be rather brief in my remarks and ask that the testimony that I have prepared and distributed to the committee staff and to the committee be entered into the record.[1]

The CHAIRMAN. Without objection, so ordered.

Dr. DUNCAN. I want first to indicate that the policy environment within which the discussion takes place is one of relatively slow world economic growth, relatively slow growth for food and fiber demand in the world—certainly less rapid than had been expected, soft agriculture prices, and considerable financial distress across the American agricultural sector—not only among farmers but also among agribusiness persons on the input and the product side of the farmer and, of course, difficult times for the rural communities of America. Indeed, most of these rural communities, dependent upon farming for their subsistence and vitality would argue that they have not yet seen significant economic recovery.

In that kind of an environment, it would be all too easy to move in the direction of a regulated agriculture in an effort to sustain farm incomes. That would be a very imprudent action, in my judgment, since American agriculture is increasingly dependent on an export market. Indeed, by the end of this century, we may be able to produce all of our domestic needs in American agriculture from just one-half of our current cropland. That would mean immense excess capacity if we do not become competitive in the world marketplace.

Having posed a likely environment, let me comment on national policies. National policies are more important to the success or failure of American agriculture in the environment posed than are sector-specific commodity programs.

I have in mind the Federal budget deficit, that has meant higher real interest rates than otherwise would have been true. That has, of course, meant a higher valued dollar. The combination of high interest rates and the higher valued dollar have slowed economic growth around the world and made it very difficult for American farmers to compete in the world marketplace. Additionally, that marketplace is becoming somwhat more crowded as other producers around the world enter it.

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[1] See p. 282 for the prepared statement of Dr. Duncan.

I have in mind tax policies, as well. Agricultural producers have seen in some parts of the industry, particularly in livestock production and some specialized crop areas such as wine grapes, the entrance into agricultural production for tax-sheltering purposes by those who wish to shelter nonfarm income in agriculture. That has resulted in an excess capacity for a number of products. In the case of cattle feeding, for example, nonfarm decisions have become more important than farmer decisions in determining how many cattle are on feed in the country.

There are economists who would suggest that Federal tax relief for business has helped this country become a prime investment target for foreigners. If true, that will have further added to the strength of the U.S. dollar. Indeed, some economists are now arguing that lower taxes on business investment in other industrial countries might be appropriate to help ease the dollar's value.

Finally, as American agriculture becomes more dependent on a world marketplace, and indeed as the U.S. economy becomes more dependent on that marketplace, a particularly complex problem takes on added importance. That problem is that from time to time, national security and foreign policy objectives of the U.S conflict with trade objectives.

I cite the Russian grain embargo of the late seventies, the Russian gas pipeline embargo of the early 1980's, the country allocation of Public Law 480 food assistance, and continued discussion over cargo preference as all being cases in point.

Enough about national policies. I will now turn to agricultural policies.

I sense a convergence of views in the Congress and indeed, across the agricultural sector, that policy must move to market orientation for agricultural commodity prices, and particularly for those products that move in export markets.

I find the administration and the Helms bills to be quite satisfactory in the direction they are moving commodity prices. I note also, the growing fragility of financial conditions in American agriculture and suggest that it will be necessary to, in the early years of adjustment to market pricing, replace a good bit of the revenues lost to farmers by some kind of Government subsidies—target price programs or perhaps through some type of multiyear land retirement program. I think a 25 million acre land retirement program on a multiyear basis is not at all out of line with the movement toward greater market pricing in American agriculture.

In visiting with farmers in the Nation's heartland, I find considerable sympathy for the direction that your bill takes, Mr. Chairman, regarding limitations on target prices and on total subsidies in a given year for a single farmer. However, I wonder if it might not be appropriate to stay with the current $50,000 payment limitation at first, and then adjust the subsidy limit downward over a period of years to the U.S median family income.

I say this not only because of my concern about the financial fragility of farmers, but also because I think there will be a selling job necessary to convince farmers—in a period of considerable financial adversity—that a move toward market orientation is in their long run interests.

I wish to address two final points. In the case of FmHA lending, I concur with the administration's intent to move away from direct lending and toward guaranteed lending. I further suggest that loan guarantees be for limited periods of time, with the portion of the loan under guarantee declining over the period of that loan; so that credit discipline would be returned from the Government to the private sector borrower and lender during the term of that loan. Indeed, such a policy would provide the FmHA a way out from under those loan situations in which a borrower cannot make a success of his or her business.

I am a little concerned about the intent to move the FmHA completely away from any rural development emphasis. I understand that such lending has not been particularly successful. But, I note the quickened pace of change occurring in rural America and expect that there will be renewed interest by State governments and rural communities in rural development issues.

Second, I am heartened by the emphasis in the Helm's bill on the use of Public Law 480 funds for longer term food development and economic development assistance activities. It seems to me that the future of American agriculture lies not in selling just to the domestic market and to the developed countries of the world—both of those markets are increasingly mature. The future of American agriculture lies in tapping a reservoir of potential food demand in the low- and middle-income countries of the world.

I suggest it would be desirable, over a period of years, to strengthen substantially efforts to provide strategic, targeted development assistance to spur the economic performance of those low- and middle-income countries of the world. Absent that, this could be done with a public sector/private sector partnership. American agriculture will have excess capacity well into the next century, and immense pressures will build in this country for protectionism. Conversely, if we are successful in turning around the growth of food demand in developing countries, American agriculture will share significantly in demand growth, and the U.S. will have an opportunity to substantially improve political and economic stability in those countries.

In summary, U.S. agricultural policy is at a crossroads. Agriculture's interests will be served by moving toward market-oriented policies. The fragile financial circumstances of many farmers and agribusinesses, however, call for more generous and longer term Government assistance to ease the transition, than had earlier been thought.

Appropriate national policy choices must also be made. Finally, a carefully conceived strategic policy of development assistance to Third World countries is clearly in the interest of U.S. agriculture and of the United States.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Dr. Duncan.

You were addressing the Third World, and I think of a conversation I had yesterday with Senator Garn, who just made a little trip—25 million miles, or something like that—and he was describing various aspects of it, including problems of weightlessness. I was surprised—never having taken many trips into space—that they do not have any beds or anything, but then he pointed out that they did not need any.

But the point he made, just casually, he said you know, up there, looking at this world, you get a different view of problems. He said, why is it that we cannot work out something—we can do everything with computers, and we can shoot people into space and bring them back and that sort of thing—but he said you cannot tell any difference between the Third World and our country, just looking at it.

I, of course, applied that to our abundance here, our ability to produce. We have to unravel a problem that, if we put our minds to it, may not be all that enormous. Maybe they ought to send all Senators into space for a little while so we can have a different perspective.

We have had two excellent statements so far, and we have got a third coming up from Dr. Johnson.

STATEMENT OF DR. D. GALE JOHNSON, DEPARTMENT OF ECONOMICS, UNIVERSITY OF CHICAGO, CHICAGO, IL

Dr. JOHNSON. Thank you, sir.

In the letter asking me to participate in this hearing, I was asked to present my views on the major policy options. There will be some repetition of the previous two very good statements. Three major policy options were outlined: One is to continue with current programs, roughly, the 1981 act and the Dairy Program, with minor modifications. The second one is mandatory production controls as a primary tool, and the third one is the transition to market orientation.

I will be quite brief. I have a paper that backs up pretty much what I will say, and I would like to have that introduced into the record, if I might.[1]

The CHAIRMAN. Without objection, it certainly will be.

Dr. JOHNSON. The critical situation in which agriculture now finds itself has been well defined by the previous two speeches. We have to face up to the fact that U.S. agriculture now has the capacity to produce more than can be sold at prices that will yield an acceptable return on the resources used in agriculture.

But a continuation of present policy and programs, in my opinion, will only worsen the situation rather than contribute to a solution, because the excess capacity has been due to many factors, but one of these is an encouragement of expanded production of the very, very high target loan price rates of the act of 1981. These policies have encouraged holding resources in, or adding to resources in agriculture, when it would have been desirable to have reduced the resources so used.

Dr. Duncan referred to a very important issue; namely that our income tax laws have induced resources to come into agriculture at a much greater rate than would have occurred if there were no farm tax shelters.

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[1] See p. 286 for the prepared statement of Dr. Johnson.

Someone—I think it was Willard Cochrane—said that agriculture has become the Nation's biggest tax shelter, and I hope that Congress will look at these issues.

Another problem, it seems to me, with the current policy, is that when we have supply management programs with price support levels that encourage the accumulation of surpluses in the hands of the CCC, we encourage production in other countries. Farmers in other countries that produce the same crops we do—wheat, cotton, and tobacco—know that the United States because of its legislation is going to step in, reduce its production and put a floor under world prices. So, in many ways, our policies are contributing to the existence of our excess production.

In addition to that, as Dr. Duncan mentioned, the macroeconomic variables have contributed importantly to our problem of excess resources and the low domestic returns, and especially the high foreign exchange value of the dollar. But not everything should be blamed on the dollar. There was a warning that we were in difficulty with too much production capacity in 1977 and 1978, when the dollar was the weakest it has been ever, and yet we had expenditures on farm programs that were as high as they were in real dollars in 1965-70. So we did not accept and work on that warning that we had.

We should not assume that a decline in the value of the dollar or even a sharp fall in the interest rates is going to cure all the problems that face agriculture. Unfortunately, we do not live in that world. So I argue the continuation of the present programs will not assist farmers to adjust to the reality that they will face for the rest of this decade and into the next.

With respect to mandatory production controls, I think that is an alternative even more damaging to the interests of U.S. farmers than the continuation of current policy. Mandatory production controls assume that U.S. agriculture has a monopoly position in the world, and by cutting back our production, we can so influence world market prices as to increase the net income of U.S. farmers. But there is no evidence, that such an outcome is possible for an extended period of time—and by "extended," I mean not more than 2 or 3 years. Perhaps we can bolster world prices without significant loss of markets for 1 year or 2 or at most 3. If we are thinking of the long run, we are just going to encourage other countries to expand their production and to undercut us, and we will have to continuously restrict our production and retrench more and more into the domestic market. As we all know, U.S. agricultural production capacity is way beyond anything that the domestic market can take.

If you look at world grain production, which is about 1.5 billion tons, the United States produces about 300 to 325 million tons, or one-fifth of this. This seems like it would be enough to have a big impact, but if you ask yourself what would happen if we reduced our production by 15 percent—and there is no way in world market prices that you are going to increase by 15 percent, even to hold total revenue constant, let alone give us some improvement—and even if we got some increase, it would not last very long, because of the reaction of other countries.

Another problem that needs to be recognized and is evidenced by the Canadian experience as much or more than ours, that if we have mandatory controls, that essentially get the rights to produce, associated with the amount of land or with the number of cows or the number of chickens you have, the value of these rights are going to be capitalized into either land or the value of quota.

The situation in British Columbia is that the value of the quota for the output of a cow is worth from five to eight times as much as the cow is worth. That means that anyone new coming into the business has to buy the right to produce, so he does not benefit from having higher milk prices but instead incurs an additional cost.

The third point I would like to make is to state quite categorically that a move to a greater market orientation seems to be the only viable alternative that has the prospect of leaving farmers better off in 1990 than they are in 1985. Now, one might say that is not a very great trick to be able to make them better off in 1990 than in 1985—though I think a continuation of the present policy would probably make them worse off.

We have to recognize, as both Mr. Schnittker and Dr. Duncan have said, that U.S. agriculture depends on exports to live, to be profitable, and repealing our productive capacity is simply too great to depend upon the domestic market.

Our current farm programs have made the U.S. agriculture a residual supplier, once again. We worked for 15 years, part of the time—John Schnittker was responsible for policies—to keep the United States from being the residual supplier. By the end of the 1960's and the beginning of the 1970's, we had pretty well accomplished that. But now, once again, we are back to where we are the holders of the world stocks, and everyone else sells their output before we get a chance to sells ours, by just undercutting us a bit.

But we have to recognize what moving to market orientation means. The two, previous witnesses have indicated some of the points, that we clearly have to lessen the burden of the impact upon farm people of a sharp move toward lower price supports and either lower target prices or the elimination of target prices. I fully agree with that.

But I would like to make a point that there are two, three other issues that, it seems to me, need to be addressed if we really believe we want to move toward market orientation. One of these is that trade liberalization must play a key role in our having a market-oriented farm policy. I do not think there has been enough emphasis on this point in the hearings, at least as I have scanned them.

In particular, we cannot expect other countries to liberalize trade so long as we keep our GATT waiver under article 11. In 1955, we asked for a waiver which permits us to use quantitative import restrictions, or virtually any other device that we want to use, without time limit, without any support for our doing it; and as long as we have that waiver, our competing areas such as the European Community, laugh at us in our efforts to liberalize agricultural trade.

It seems to me we must also remove the damage that was created in 1958 by our failure to approve a clause in GATT against the use of subsidies, particularly export subsidies. By that refusal, we opened the door to the common agricultural policy of that European Community that includes the export subsidy as a major policy instrument, and it is going to be hard work to get rid of that.

My final point is that market orientation in my mind does not include the significant use of export subsidies. That is not market orientation. If we object to the European Community using export subsidies, we are forgetting, I am afraid, that our deficiency payments programs are also a form of export subsidies—and are so claimed to be by the EC.

So I would hope that we will follow along policy programs such as Senator Helms introduced which, as I understand, will provide for a gradual phaseout of deficiency payments over time, and the administration proposal, and that we would then be in a position to go with rather cleaner hands into negotiations on agricultural trade than we have had in the past. We need to recognize that our domestic programs should be consistent with what we say we want in the international trade arena.

Thank you, sir.

The CHAIRMAN. Thank you very much.

Senator Dixon from Illinois has arrived, and Senator Leahy, who are excellent members of this committee.

I will say to them that the committee has just heard three of the finest statements I have ever heard since I have been a member of this committee, and I thank each of the witnesses.

The buzzer that goes on up there, pay no mind to it——

Senator LEAHY. We don't.

The CHAIRMAN. That is indicating dead quorums, as we call them, and that sort of thing; wasting time over there.

Senator DIXON. Mr. Chairman.

The CHAIRMAN. Yes.

Senator DIXON. I wonder if you could indulge me. I also have a meeting of the Armed Services Committee, and I would like very much to ask Dr. Johnson a question, if I could, before I leave.

The CHAIRMAN. Why not? Go ahead.

Senator DIXON. I want to thank all of you for the contributions you have made, and I want to assure you that, though I did not hear all of your testimony, I will read all of it.

May I say to my friend from the University of Chicago that Sam Skinner and others from the CTA were here testifying in the Appropriations Committee, and it was necessary for me to introduce them. I have a meeting of the Armed Services Committee as well right now.

But the thing that intrigues me is how we get around this problem of wanting to go to the free market, as we all do, while a free market does not exist in the world marketplace. Of course, your conclusion largely devoted itself to the EEC and what they do there, and the subsidization that takes place in the European Common Market is notoriously well known to us and presents the kind of problem that I see as insurmountable. That is, how do you reach a free market that does not exist; how do you let the American farmer compete in the free market, let his prices reach a free market level, when the European farmer—under those same circumstances—compete in that same marketplace and is subsidized?

Dr. Johnson. Well, I think what you say is an accurate description of what the present situation is.

Senator Dixon. But won't that exist—I mean, unless talks achieve an accommodation—and of course, all of us would support that--I do not have any problem with the American farmer being the best competitor in the world in a truly free market, you see.

Dr. Johnson. Well, the European Community from a budget standpoint faces many of the same problems the United States does. The agricultural program was under very considerable financial pressure, and still is, but less so because of the strength of the dollar and the fact that there are now, for example, no significant export subsidies on wheat out of the European Community. The international market price with the rise in the value of the dollar has come very close to the intervention price in the European Community.

But to go back with the point I was starting with, the European Community has important budget problems, and if we were not holding up the international market price the way we are, their budget problems now would be much more severe than they are. So they are also under similar pressures to what we are in the United States, to get their costs under control.

So I do not consider the prospective trade liberalization negotiations entirely hopeless. I must admit, I would not bet very many dollars on the outcome, but nonetheless, I think we have to try. In order to try, it seems to me we need also to get our own house in order, or at least say we are moving in the direction to get our own house in order.

Senator Dixon. I agree with that. I just wanted to comment—you said something earlier in your remarks that I agreed with so completely when you said:

> For us to have all kinds of policies in this country that we think are going to affect the world market, you were pointing out the small share—even though it is a big one—that we have in the world market.

I was entirely persuaded by what you said.

I just wanted to make this final comment, if I may, about the frustration that we feel in this committee, which I think we all share, our ranking member and the chairman and certainly, this minor member from the end of the table. I think it was last year, Mr. Chairman, when all of us got together one time and we were so outraged at what was happening and so forth. We finally voted here, I think, to sell a whole bunch of our dairy surpluses. We thought we had done a good day's work. At that time, my office was in the Dirksen Building, and later in the day, the Ambassador from New Zealand came by, in a real nice-looking tweed suit, and said, "This is terrible. This is awful. All we do is export dairy products, and you just ruined our day by voting to sell some of yours on the world market and all." And I said, "Well, gee, you know, I am just one member of the committee. You would have to talk to the administration."

Anyway, I guess it did not happen after they talked to the administration. You know, what pals they turned out to be. We cannot send our nuclear ships into their ports, and every other kind of thing, and you know, that kind of thing really frustrates me in terms of this committee. It seems to me that we do not respond sufficiently well to the external pressures that influence all of these decisions. And yet, at the same time, we are the first to concede, as you suggest to us, that we are part of a bigger game than just selling these goods in the United States.

I just wanted to make that comment. What you said was very valuable to me.

The last question I would like to ask is, I was interested in your statement that when the dollar was really soft, that we had the same problems back in 1977 and 1978. What would be your simplistic explanation of that, if there is one?

Dr. JOHNSON. Well, our farmers, partly in response to entreaties by Government, partly in response to what they thought was the long run future of agriculture, in the mid and late seventies, the time when many people assumed, incorrectly, obviously, that the world was going to be short of food, had actually expanded our productive capacity very greatly from 1972 to 1976, 1977, we were producing more than we could sell at what were not all that high prices.

Senator DIXON. So just simplistically, overproduction rather than the strength of the dollar.

Dr. JOHNSON. That is right, yes.

Senator DIXON. I appreciate your saying that. Thank you very much.

Dr. DUNCAN. Senator, I think there is a point that should be made with regard to the dollar. Those in agriculture tend to place more importance on the value of the dollar as an impediment to export market growth than I think appropriate. It seems to me that the maturing of the traditional export markets for American food and fiber in tandem with very poor economic performance in low- and middle-income countries of the world are the major impediments to export market growth. The dollar is somewhat less important—although still a very significant problem.

Senator DIXON. I appreciate that.

I want to thank the Chair for letting me use no rank at all to ask a question before the Chair.

The CHAIRMAN. My pleasure.

The problem we have around here is—well, I have four committee meetings going on right now, Foreign Relations would be my other major committee, and two others.

Well, let me ask a few things.

Dr. Johnson, or any of you gentlemen, I believe in 1983 about 44 percent or more of direct Government payments went to farm operators whose family income was greater than the median family income in this country. Even more astounding is the fact that almost 7 percent of these payments went to the largest one percent of the farms. That 1 percent had gross sales above $500,000; they had an average farm operating family income of, according to my information, close to $611,000; they had an average equity of $2.7 million. On top of that, Government payments accounted for only about 4.5 percent of their total family income.

Now, as a practical matter, what would be the effect on the agricultural sector if these farmers were to be excluded from Government programs?

I will throw that ball out for you to catch.

Dr. JOHNSON. The problem you mention there is whether we depend upon a continuing supply management program, particularly a voluntary one. If we are going to have a voluntary supply management program, you have to buy the output reduction. These particular groups of farms that you mentioned, the top 10 percent or so, are responsible for such a large share of the total sales of agricultural output that you will have to buy them off, so to speak. You will have to induce them, if you are going to use supply management as your tool.

So, I think it is inevitable that under such circumstances, they will get a large share of the payments.

I would argue—and I did not make the point—that in this transition period, when we are primarily moving toward helping farmers provide under the present debt situation and so on, that we should ignore supply management except perhaps for 1 year, and then the payments after that, if you have a deficiency payment scheme, the payments should not even be related to this year's output; it should be related to some past level of output or some past measure of output, because as John Schnittker says, whenever you have target prices that are associated with this year's production, you are going to encourage more output. Then you have to buy it back by making higher payments to get people to voluntarily reduce their production. But if you do not tie the payments to supply management, then you can—as your bill suggests, restrict payment to low and modest levels—modest compared to the figures you have given for the largest one percent of the farms. So in that sense, I see no reason why you could not either largely exclude such farms, or if that were not legal, limit the payment to something like $25,000.

Dr. DUNCAN. Mr. Chairman, I concur with Dr. Johnson. I raise the question, however, of the near term and the financial fragility of some large scale family farmers. Currently, farm real estate values in the agricultural heartland continue to decline. In my Federal Reserve district, the 10th district, farm real estate values are off about 37 percent on average from the market high in 1981, and give no indications of slowing their decline. As those values decline, farm families that were sufficiently capitalized are being pushed into a high leverage position and are becoming financially vulnerable.

There is value in using Government policy to moderate the pace of adjustment in asset values to prevent precipitous declines and sharp undershooting of land values below those required by market fundamentals. I have no particular interest in seeing land values supported above those that are justified by market fundamentals. I am concerned, however, about abrupt movement toward market oriented commodity prices unless the adjustment can be cushioned by Government policy. To do otherwise could jeopardize the stability of large scale commerical farms.

Second, I am concerned about the ability to sell a market oriented farm program to farm interest groups. I believe market orientation is vital. Mr. Chairman, you have included in your bill a prudent adjustment toward market pricing as well as having provided a reasonable transition to market orientation.

Congress really needs to retain that concept, but perhaps be somewhat flexible at other points in the legislation to achieve a fundamental shift toward market orientation.

The CHAIRMAN. Well, I guess the problem with trying to solve these problems is the Government, and I concluded long ago that most of the time, Government is the problem. When you push one end of the seesaw down, the other goes up, inevitably.

I have been making speeches around here based on information that I consider reliable. The budget reduction package presently before the Senate, if enacted as is—which it won't be—could immediately bring interest rates down 2 or 3 percent. That is the forecast.

What effect would a 2 or 3 percent drop in interest rates have on the farm economy?

Dr. DUNCAN. The effect would be very salutary, Mr. Chairman. That would mean a reduction of as much as $4 to $6 billion in farm production expenditures, which would add directly to the profitability of the farm sector.

One should be careful, however, to recognize such an interest rate reduction would not resolve the problems of the most heavily leveraged farmers. I, frankly, am of the view there is not much long-term viability for farmers who have debt-to-asset ratios much over 70 percent. There are around 100,000 of them, and they hold about $43 billion of the farm sector's debt of $215 billion.

The CHAIRMAN. That may be the most painful fact of life we have to face, that whatever we do is not going to work for them.

Dr. DUNCAN. Yes.

The CHAIRMAN. There is just not enough water in the bucket.

Well, my calculations are that on the average, for farmers, 20 percent of their overhead is interest. Is that about right?

Dr. DUNCAN. That is approximately correct.

The CHAIRMAN. So that is $2 out of every $10 off the top. Then, with the increase in the costs of production and so forth, it is a pretty bad situation.

A couple of farmers down in North Carolina were talking the other day and one said, "If it doesn't rain, I am going to have to rob a bank."

The other one said, "If it doesn't rain, I have already robbed one."

Well, the so-called marketing loan concept, of course, allows the farmer to place the grain under loan at a price that is set by Government, and you have alluded to this, all three of you, directly or indirectly.

Most have suggested that this loan level should be at least as high as the current loan levels. Given the fact that the farmer repays only the loan based upon the current world market price at the time he sells his grain, what is the down side potential for a large spread between the loan level and the actual repayment level?

I guess this could be called sort of a double deficiency payment, couldn't it?

Mr. SCHNITTKER. It could be that, Mr. Chairman, if it worked. I have seen various versions of the market loan rate drafted. Some, I feel, would function just like the present loan rate, supporting the price at or near the loan level; therefore, not getting the leverage in export markets of lower market prices, and not costing very much.

But if the market loan concept were to function the way its original proponents have said it would function—to give the farmer, let us say, a loan of $3.30 a bushel for wheat, and later on, he would perhaps sell that wheat in the market for $2.90 a bushel, and the Government would take the 40-cent loss—then we could easily have a $3 to $5 billion additional Government cost that needs to be anticipated and written into the budget.

So, I find that the direct approach to reducing the loan is much more useful and predictable in 1985 than the so-called market loan concept, which I think may well be a trap, (a) not to become competitive if it does not work right; or (b) if it does work, to cost $3 to $5 billion more than had been anticipated, and therefore, embarrass the farm programs a year or two down the road.

The CHAIRMAN. Senator Boschwitz has arrived.

Senator BOSCHWITZ. I do not want to interrupt your line of questioning, Mr. Chairman.

The CHAIRMAN. Is the Foreign Relations Committee over—or have you been to another committee?

Senator BOSCHWITZ. I just came from home.

The CHAIRMAN. You can see the problem we have around this place? [Laughter.]

Well, I may pull Rudy's chain on this, but the Congress has acted again and again on the dairy surplus problem, and it persists.

What do you recommend that Congress do?

Mr. SCHNITTKER. I think dairy has come further toward a market solution than any of us anticipated a couple of years ago, and further than some of the other commodities. Therefore, if the Congress will restrain itself and let the reduced support level already in the law come into effect on July 1, the $11.60 per 100 pounds, and then if the Congress will adopt a formula that says 6 or 12 months later, if the dairy surplus, actual or estimated, continues to exceed 5 or 6 percent of total production, that you would have to lower the support another 50 cents—which is sort of what we have doing been in the last couple of years—I think we could easily be very close to a fairly well—balanced market-priced system in dairy within 18 to 30 months.

Dr. DUNCAN. There going to be both winners and losers as a result of growing dependence on exports. There are some commodity groupings in American agriculture that may be disadvantaged or that will have to accept greater adjustments than sectors, as a result of moving toward market-oriented agriculture and a more competitive posture in the world marketplace.

Dairy may be one of those; sugar may be another. On balance, however, American agriculture will be well-served by moving in that direction. This discussion points up something Dr. Johnson mentioned earlier—the current interest in a new round of multilateral trade negotiations. Those people in American agriculture who support such a round—and there are many—have well formed formed ideas as to what expect to receive in the this forthcoming negotiation.

However, the reviews are much less well-formed on what they are prepared to give in up in that negotiation. Frankly, I think we need some firm understanding on what we might be prepared to give, before we go into a multilateral round.

The CHAIRMAN. How about monitoring us on this? Keep in touch.

Dr. JOHNSON. On the dairy, I agree with John that output adjustment has moved much faster and much farther than I think most of us anticipated would be the case a year to 18 months ago.

I think the important thing is to just keep at it. Dairy may be a model, even though there are still problems down the road on trade, perhaps, that dairy could be a model for other efforts to move toward market orientation. The important thing, it seems to me, is to make a start and then to continue down the road until you have achieved an objective, such as keeping the U.S. demand supply for dairy products roughly in balance, as a first objective. That, it seems to me, is a very important objective, and it seems within reach.

The CHAIRMAN. Yesterday, right at this table, I met with some margarine—I will bring up a heresy here—people, and they are being hit hard by the free distribution of butter, and cheese. They say that 80 percent of all of these commodities given away—and the USDA study supports this—80 percent represents a displacement for them. Of course, then we got into the business of soybeans, and what that does to the soybean farmer, and how many people are out of jobs because of margarine decrease in sales and production. So I guess that seesaw goes up and down.

Yes, sir?

Mr. DUNLOP. Mr. Chairman, I want to advise you and the other members of the committee that the rules of the Senate prohibit us from meeting past 11:30.

The CHAIRMAN. Well, let me hush then and let these other Senators have at these witnesses. Before I do that, I want to say again, I appreciate the efforts you made to come here and your preparation. It certainly has been helpful to me.

Senator Boschwitz—and I should point out that Senator Harkin has arrived.

Senator BOSCHWITZ. Did you want to make a statement, Senator?

Senator HARKIN. No, thank you, Senator.

Senator BOSCHWITZ. I think Mr. Schnittker and Dr. Johnson seem to be implying positive comments about my dairy plan, and I think that dairy is closer to being in balance in reality than are some of the other major commodity groups.

I apologize for not being here a bit earlier, and I would like to ask some questions.

Mr. Schnittker, I understand that in the record yesterday, Senator Cochran put in some questions and answers about the marketing loan, and I recommend that you read that. I am going to read it, too, because I am not sure I understand all aspects of it.

If wheat could only go to $2.90, that would be one thing, but I am afraid that there is a rather broad budget exposure with respect to the marketing loan concept.

I like it, and I would like to impose the marketing loan concept in 1985 to reopen the program or to do something else. Otherwise, I am afraid that CCC acquisitions will be very, very high for a number of commodities as the world markets wait for lower prices.

I note in your testimony, Mr. Schnittker, that you want to reduce the wheat prices or the corn prices relatively gradually. And you know, we are going to take a beating politically lowering the loans, so I am more inclined to take one sound beating and lower the loan rate, as you see in that plan of mine, down to $2.20 on wheat and $1.90 on corn.

From what the Department of Agriculture and OMB tell us, it would appear that we would regain our market share relatively rapidly.

I do not understand the rationale for going down gradually, Mr. Schnittker, and I read your statement rapidly, Dr. Duncan. What is the rationale for going down gradually? Is it political?

Mr. SCHNITTKER. It is both political and economic. I was trying to describe a course of action which seemed to me practical from both the political and the budgetary standpoint this year. But if you lower the wheat loan to, say, $2.20, and the market price goes to, let us say, $2.40, but you keep the target price at some arbitrarily high level near present levels, then you have an immense budgetary exposure which will not fit within the probable budget policy.

Senator BOSCHWITZ. Dr. Johnson has my plan, and as he notes, you must keep the prices high if you do what you want to do here in the set-asides. You do not appear satisfied with the set-asides that the administration has proposed. You want to have 20, 15, and 10—does that apply to all crops, Mr. Schnittker?

Mr. SCHNITTKER. I think there might be some variations. If I were administering it, I would tailor make them, because situations do differ among commodities. But the reason I suggest that, is that the payment levels likely to be offered will support set-asides in the first year of at least 20 percent for most of the commodities. Payments that are going to be offered are either going to encourage the farmers to produce more, or they can be used under the set-aside concept to let them lay aside some land and not produce such large surpluses.

Senator BOSCHWITZ. Unless you do what one of these gentlemen suggested, although that is not predicated upon this year's production, but rather, upon past production. We do that in our bill, so that we do not encourage people to produce for the program.

In the event you allow a farmer to produce on 100 percent of his land, and do not require that he set aside 20 percent, or you hold the price up on the other 80 percent, so that he will also be able to gain enough from what he plants there to cover the overhead on the other 20—don't you think you could then lower the target prices?

Mr. SCHNITTKER. I am sorry I did not understand the question. I feel that if you lower the target prices so that you are not giving the farmer a great new incentive to produce, well, then that might work all right. But if you lower the loan and keep the target price up near present levels and do not have any set-aside at all, you are just pouring gasoline on the production fire.

Senator BOSCHWITZ. Well, that is not reasonable to assume that if you do not have a set-aside you should keep the target prices at present levels.

Dr. Johnson, you have my plan in hand there. What do you think of the approach of no set-asides, having full production in agriculture, not producing for programs, and of being able to reduce, if you will, the target price, or you may call it a transition payment? My plan also reduces the loan price to a competitive level in the world market, affecting not only 1986 crops, but perhaps through market loans or some other device, include this year's crops as well.

Dr. JOHNSON. Well, I am very much in favor of the idea of divorcing the payments from the current production activity, which is what your bill does——

Senator BOSCHWITZ. Yes—we don't even require that the farmer produce.

Dr. JOHNSON. That is right. The real inconsistency with our policies for 50 years has been this idea that we want to make people earn their subsidies, and in order to make them earn them, we induce them to produce more. Since our capacity to produce is greater than what we need, that it seems to me has been erroneous all the time.

So, I very much favor the idea of divorcing the payments from current production activity. I guess in terms of what you are recommending—and I have studied it in some detail—is whether the payment would be a fixed payment regardless of what the market does, or whether it should be more like a target price, but set at levels that are consistent across crops. But if the markets should turn out to be quite a bit stronger than we had anticipated, the deficiency payment would be somewhat less.

Senator BOSCHWITZ. The Department of Agriculture, as a matter of fact, estimated that the prices would rise under this plan, if you take the whole cut the first time around on the loan rates. The hope of this plan for the farmer is that in the event that the market price does rise—and I think $2.20 a bushel would be about $108 a ton which may be below the market at the moment—part of our plan is that the benefit should inure to the farmer, so there is some hope in the plan, because the transition payments decrease as you return to a free market.

Have you had a chance——

Dr. JOHNSON. Well, obviously, I think, a judgment which the people around this table are much better qualified to make from that side than this side, is what it takes to make this transition to market orientation palatable and acceptable. It may well be that something that permits the farmers to retain the advantage as market prices strengthen, or retain a good part of it, would help sell—and I cannot dispute that.

Senator BOSCHWITZ. Let me make a statement and then ask each of you to comment on it, as we are rapidly running out of valuable time, so that my colleague from Iowa may have an opportunity to also ask a question.

The basis of my approach is that we should have a transition to full production; second, that we should immediately become competitive in the world markets; and third, that we should have some form of income protection. The income protection would be provided by transition payments, predicated on past and not present production, so that it is not jacked up in order to plant to produce for the program.

Furthermore, we have the large conservation reserve of 30 million acres, and we could pay on 20 million acres on the basis of bid. In that way, the people who want their bids accepted will keep their bids down, because they know that 30 million acres are going to be laid aside and 20 million will be paid—but no set-aside, and full production, because the whole infrastructure of agriculture is on its knees. You can give me the statistics on the farmers, and I will give you statistics on barge owners, truckers, implement dealers, or seed dealers—the whole farming system is on its knees, and our bill has to be voted not only to the farmer, who is certainly the linchpin of the whole business, but also to the farm infrastructure.

I would like to have your comments, if I may, on the approach that I have taken, presuming that you have read it.

The CHAIRMAN. Before you begin your response, as Mr. Dunlop has indicated, the rules of the Senate require that formally, the committee cannot meet after 11:30, but there is no rule that I know of that we cannot sit around informally and serve an equal purpose. But answer the question, and then we will go to Senator Harkin.

Senator BOSCHWITZ. I noted that we were running out of time, Mr. Chairman, so maybe you should answer briefly, and then I will stick around, so that my colleague from Iowa can have an opportunity to ask questions.

The CHAIRMAN. Fine.

Senator BOSCHWITZ.Then we can talk about it further.

Dr. DUNCAN. Senator, if you take sufficient land out under a multiyear retirement program, then no set-asides may be acceptable. However, I believe it might be well to keep some provisions for set-asides or diversion in the legislation at the Secretary's discretion with some constraints put in place by the Congress.

I am doubtful that we can quickly recapture export market share and turn the American agricultural sector around. I do not share that optimism. I think we are in for a very tough decade. The answer to American agricultural problems lie in stronger world economic growth and U.S. economic policies more conducive to trade.

Dr. JOHNSON. I would not favor keeping the subsidies in, because if we keep them in the legislation, they are going to be used, and I think they give a signal to our competitors abroad that the United States is still going to play the same kind of role in the future that it has played in the past, which is to hold an umbrella under the world market.

I would go on to add, though, that I think the major merit to your conservation set-aside, that aspect of the program, is probably more of protecting fragile lands than it is reducing production. I think really, output on those 20 or 30 million acres that would likely be taken out under a bid system would be of limited significance. But it is mainly, I would think, a way of assisting people who have now been encouraged to be on these lands by the disaster payments and so on, and optimism about the future, a way of encouraging them to pull back.

Senator BOSCHWITZ. We would not even make the transition payments on land that was determined to be fragile.

Dr. JOHNSON. That is right.

Mr. SCHNITTKER. Senator, I think the more we can reduce the loan in the immediate circumstances, the better, notwithstanding my testimony. That was testimony geared to what I judged to be a political and budgetary situation.

Second, I have no objection to separating payments from current production. But on any farm, next year's production will not be very different from last year's production, and I do not see a great distinction.

Third, I strongly support the conservation reserve, if it is not shot full of loopholes like acreage diversion programs have been shot full of loopholes. I hope that the Congress will seriously consider it.

Senator BOSCHWITZ. Thank you.

The CHAIRMAN. Thank you.

Senator Harkin?

Senator HARKIN. I do, too——

Mr. DUNLOP. Mr. Chairman, before you proceed, I might note for the record that I believe our clock is wrong, and I think it is exactly 20 minutes after, as opposed to being 25 after.

Senator HARKIN.My watch indicates that it is 11:24.

Mr. DUNLOP. So you have your 10 minutes, though, Senator, I believe.

Senator HARKIN. I will not take 10 minutes.

Dr. Johnson, do you have any written testimony?

Dr. JOHNSON. I have a paper here that I am going to include in the record

Senator HARKIN. I would just like to take a look at it. I saw the other ones, but I did not see your testimony.

Just going through Dr. Duncan's and Mr. Schnittker's testimony, I have a couple of questions. How low will the price of corn and wheat go if we have an 8 million bushel corn crop this year and a 2 billion wheat crop, which seems very likely?

Senator BOSCHWITZ. I hope the wheat crop is going to be larger than that.

Senator HARKIN. Or 2.4.

Mr. SCHNITTKER. You refer to how low would it go in the absence of the loan program—I think with the loan program, the corn price will only fall a little below the loan, maybe to $2.40 a bushel, and the wheat price will fall to, say, $3.15, just below the $3.30 loan. But in the absence of a loan——

Senator HARKIN. Yes, in the absence of a loan.

Mr. SCHNITTKER [continuing].—In the absence of loans, I suppose we could have $2 corn and $2.75 wheat in 1985-86.

Senator HARKIN. It seems to me that is what is being advocated by some people, in terms of doing away with loan rates. The administration's bill would have had us drop the loan rate next year to $2.15 or something. I just wonder what the economic consequences of that would be, in the absence of a loan rate, we have $2.55 for this year's crop of corn.

Mr. SCHNITTKER. That is right, and that is one reason why I caution a transition of loan rates, not a precipitous drop. We do not know when the dollar is going to fall. We do not know when the rest of the world will have a drought or something. I think lowering the wheat loan from $3.30 to $3 a bushel for 1986 is quite a precipitous and courageous act. Secretary Block had the option to do it a few months ago, and he did not even consider it.

Senator **Harkin**. Yes. We have talked about world market clearing prices. I keep hearing this phrase used all the time. Several weeks ago I checked with an elevator in western Iowa, and the price they were paying for a bushel of corn on that day was $2.43 a bushel; the price on the Chicago Board was $2.73; the price in Rotterdam that day was $3.75, and the price in local markets in France was $5.60 a bushel—for the same bushel of corn.

What is the world market-clearing price of that bushel of corn? Can any of you esteemed economists tell me?

Mr. **Schnittker**. I am not sure I can tell you, but it is a lot closer to the $2.43 than it is to the $5.75. That is, the United States being the one country that has a relatively open market and being the principal exporter, more nearly sets the world price than anyone else. But even that is not market clearing, because the loan is there to take the surplus. So the $2 I spoke of earlier would probably be more near to the market-clearing price.

Senator **Harkin**. Because we tend to set the world price? I see every head nodding in unison.

If we tend to set the world price, and if we set the world price on some of these basic commodities at $2 a bushel, it seems to me, that, not only are we bankrupting our own farmers, but we are dragging down farmers in every other country, because as you say, they are going to set their prices somewhat accordingly.

If, however, we have a higher price than that, then we may not only have a better income for our farmers, but we are able to keep the farm price up around the world, too.

Over the last 10 years every time I have looked at world markets, whether it is the Argentines, the Brazilians, the European Economic Community, Australia, or whatever it is, their prices are always pegged just a little bit below ours. If we go up, they go up; if we go down, they go down. They just sort of bounce around and follow us around, because we do indeed set those prices.

I keep hearing all of this talk about going to this market-clearing price and doing away with support prices and going to full production. We might look at that in terms of the microeconomics of agriculture and say, well, that may be the way to go. I wonder what the overall economic impact on this country is going to be. I was looking at Mr. Duncan's testimony, and I like some of the things you said. You pointed out the tax policies, and what tax policy has done, and the high value of the dollar, and all those things, and I just wonder if that has not had more of an impact on our export policy than the fact that we have had a target price of such-and-such or a loan rate of such-and-such.

Dr. **Duncan**. Senator, please permit me to disagree somewhat with your interpretation of our assent to your statement. What I agreed to was that, since we are both a major producer and trader, and since we have open commodity markets, it is within this country that prices are determined for world trade; but those prices are determined in an open market setting, between willing sellers and willing buyers, and that does not imply we set a price arbitrarily. We are under market discipline in this country. When we set our prices too high, as I think we have in the past, we place an umbrella over world market prices; we induce new production elsewhere in the world and we certainly make it much easier for the EC's common agricultural policy to carry on their high price support and subsidy programs.

Senator **Harkin**. I heard Dr. Johnson say we had an umbrella "under" world market prices, and you say we have an umbrella "over" them. Which is it? Do we have it over, or do we have it under?

Dr. **Johnson**. It has to be "floor"——

Senator **Harkin**. I have never heard that statement before, about having an umbrella "under" the market prices.

Dr. **Johnson**. "Floor under."

Senator **Harkin**. OK, a floor under.

Again, it just seems to me that everything I have heard about agriculture is just the opposite of what we do in any other sector of manufacturing in this country or anywhere else. Using the logic of driving our prices down and continuing to produce more is like saying that Ford Motor Co. can capture all the world markets in automobiles, drive Toyota, Datsun, and Mazda, and everybody else out of business. It is very simple. We tell Ford Motor Co. to sell all their cars at $1,000 a car. We undercut everybody in the world, capture all those export markets. But it seems to me that Ford Motor Co. will go bankrupt long before we capture the world markets. That is what we are telling our farmers. We are telling our farmers, produce the corn or wheat or whatever at $2 a bushel or less, and look at all the wonderful export markets we will get. Our exports are going up, the value of our exports are going down, and that is a prescription for disaster.

Dr. **Duncan**. There are periods when Ford does sell cars at a loss. In the recent past, that has occurred, and that is true for other merchants, as well.

I concur that in the short run, we are on the horns of a very difficult dilemma. Yet, I do believe it is essential for American agriculture to capture a growing position in the world marketplace, because the domestic market is very mature, and we are further bedeviled in this country with very substantial rates of productivity growth for American agriculture. Noncompetitiveness in the export market means constantly having to shrink the size of the domestic agriculture production plant, including the agribusiness infrastructure, and that carries with it considerable trauma, as well.

The **Chairman**. Under the rules of the Senate and according to George Dunlop's sundial, we must conclude this hearing on a formal basis, but we can continue with the questions as your time permits.

The committee now stands in recess.

[Whereupon, at 11:30 a.m., the committee adjourned, subject to call of the Chair.]

[**Note**.—The following informational exchange took place after the committee adjourned:]

Senator **Harkin**. I know that they have to sometimes sell things at a loss, but it seems to me that we are facing some economic consequences in our rural areas with this lack of income that goes beyond the microeconomics of efficiency in agriculture.

If we are talking about exports, perhaps we tend to get in a rut on these exports. We have always grown our raw products, Rudy. We sell our corn and our wheat in raw form. During the seventies, a lot of countries decided that they would compete with us. Even though our prices were very competitive in the seventies, they decided for other reasons to go ahead and meet us on that basis.

I am wondering if we shouldn't be looking more at taking our raw products, value adding them, and looking for world markets for our value-added products rather than just our raw products. We will not produce as much of our raw products, but by value adding them and exporting them abroad, we will gain more income in terms of our exports.

We will need to develop markets abroad, and go after those new markets—maybe they are not even domestic products; maybe they are products that we do not even use in this country.

I have been watching the Toro lawnmower ads on television lately. It seems like every time I turn the television on, there is an ad for a Toro lawnmower. Well, having lived for 1½ years in Japan, I know there are no lawns in Japan. So they have developed the lawnmowers for this market.

I am saying that maybe there are those kinds of markets in value-added food products, whether it is in dairy or meat or whatever it might be, that would get us the export earnings, but it would not be in the raw form. I do not know if you have any thoughts on this.

Mr. SCHNITTKER. There are such possibilities, Senator, but they are limited and marginal, and they also run up against a problem. If we start a raw commodity like corn and soybeans, which may be priced a little higher than the rest of the world is pricing its corn and soybeans, and then if we have a standard of living supported by wage costs that are also higher, our value-added products may not be any more competitive than our raw products, unless we are very, very productive in our production processes.

So we should do this, but we should also recognize the limitations of it at the same time.

In food products, for example, some of the loudest appeals for export subsidies presently come from industries in this country who have value-added products—flour milling, for example—to compete with Europe.

Senator BOSCHWITZ. The Europeans have done something along the line that Senator Harkin suggests. I think that their total exports this year, certainly not in tonnage but in value, will exceed ours because they have sold principally value-added parts. To take the example of the Toro lawnmower, I am not sure it is entirely pertinent, but they happen to be a Minnesota company that went through the same kind of dip that the farmers are going through, and just about didn't make it. I forget exactly why—snowblowers; there was no snow for three winters. That is what did the Toro people in.

I am not sure that the countries began their production in the seventies, when prices were lower. I think the increase in production is somewhat more recent, particularly in soybeans. It seems almost the only way we can add value to beans, for instance, is to give them away.

The CHAIRMAN. One other point, though. Senator Harkin makes a dramatic point when he quotes the price in Rotterdam. But you have got to remember that these are Government-stipulated prices. They have about as much relationship to what they really sell commodities for as a sticker on an automobile. The undercut us. They find-out what we are going to do, and then they undercut us.

Senator HARKIN. Mr. Chairman, I have stood up before and said that competition is one thing for my farmers and your farmers, but when they are up against all the combined countries of Europe or the state trading companies of your planned economies and so on, it is not quite a fair deal.

Senator BOSCHWITZ. Well to compare the Rotterdam price to the price in western Iowa is not entirely relevant, because the Rotterdam price involves a good deal of freight.

Senator HARKIN. Yes, transportation.

Senator BOSCHWITZ. The Rotterdam price probably, Mr. Chairman, is a free price. The Dutch are very large exporters from us, and I presume, if I am not mistaken, Rotterdam would be the market price.

But as I understand it, there is an average of about 7 cents a bushel in this country to get the 68 cents to get it through the port, particularly from our neck of the woods, Senator. You will find my situation being even a little worse than yours, in some instances, unless it goes through the Port of Superior at Duluth. So you have to add 70 cents, just as a rule-of-thumb, to get it to the gulf ports and then the ocean freight, so it probably makes the $2.43 pretty close to $2.75.

But you now, we are going to have to make a decision in this committee if we are going to hold up domestic prices. Nearly 90 percent of the world's foods are consumed domestically while 12 to 13 percent of world production finds its way into international markets. That 12 or 13 percent does not always represent the domestic prices, and certainly not in Europe, as you indicated, where they hold them up. They have different types of problems there, very expensive types of problems, and some that we simply could not duplicate in my judgment, at least, in this country.

We really have a watershed in this whole farm bill, and I think we have an opportunity to do something, and I assure many people who sat around this table thought the same thing at different times.

Dr. DUNCAN. There is a particularly difficult discipline that flows from the integration of the U.S. economy and U.S. agriculture into a world marketplace. If the United States chooses to hold domestic farm commodity price levels above world price levels, we have to face the prospect of increasingly retreating into producing for a domestic market. But that is only part of the problem.

The other part of the problem is even more difficult. Increasingly, we would become concerned about protecting our domestic markets from foreign-produced food and fiber. Indeed, in the case of textiles and some produce items that currently is a growing problem.

Senator HARKIN. I understand that. But again, you are right, it is kind of a watershed year this year, because of the devastating impacts all over the Midwest in terms of low income. We have short- and long-term problems. The short-term problem is low income. We have got to get it up, and we are going to do it through income tansfers. There is not going to be the money there to give farmers direct payments. So, the only other thing is to get their market price up. I do not see how you are going to get the market price up by encouraging them to plant everthing and driving the prices down and then giving them some small transfer based on the target price. That might save them for this crop year, but what is going to happen next year, if we have the production that we are looking at this year.

And on export, is it more important to think about the quantity that we export or the amount of export dollars that we earn? What is most important?

Dr. JOHNSON. Well, obviously, the export dollars we earn is important, but the issue is whether we have the capacity to change that drastically in an up direction. And to restrict U.S. production in such a way, or to store the excess commodities that would raise the price, will also have major budgetary implications. I think that is the issue. There is no way of moving the market price up by deliberate action except something that is going to cost resources.

Senator HARKIN. I disagree with that. I think you can have a program of reduced production, a mandatory program of reduced production, that will cost the Federal Government zero dollars, but will increase the price farmers get in the marketplace because the supply will go down.

Senator BOSCHWITZ. Would you then also support the idea of building a tariff wall around this country?

Senator HARKIN. Well, that is another problem you get into. You have a problem there, because people go to Argentina and buy it, and bring it into this country.

Senator BOSCHWITZ. Let us say you raised wheat—and pardon me, I do not mean to preempt the witnesses—my answers to your question about what should be done—should we get larger value-added exports or more commodity exports—the answer is both.

But let us presume that we set wheat at $5 and——

Senator HARKIN. Or, we do not set it, but we just reduce production.

Senator BOSCHWITZ. We reduce production, and wheat thereby would rise in price, let us assume, $5——

Senator HARKIN. Well, that is pretty high, but OK.

Senator BOSCHWITZ. $4.

Senator HARKIN. OK.

Senator BOSCHWITZ. $4.38 is now the target, so certainly, you would want it at that level, $4.50. And $3.03 is the target for corn, so let us say you would want it at $3.25.

Senator HARKIN. Yes, right.

Senator BOSCHWITZ. Then you would have to make a decision of whether or not you allow corn and wheat to come in from other countries. And in the event you do, then you probably have to squeeze down the allotment to the farmers in your State and in my State, unless you have protected those farmers with rather pervasive tariff walls. We went through that, and I am not sure that I would be prepared to do that again.

Senator HARKIN. I do not know that we would have that in the short term. Now, look at the European Common Market price, as I said, on corn was $5.60. We can beat that price. Why aren't we flooding the European markets with corn right now? Why aren't we?

Dr. DUNCAN. There is a fairly direct answer, I believe. The European Common Market is no longer a growth market for American feed grains. It will be a declining market because the European Community farmers have been able to produce 150 bushel per acre wheat and 140 bushel per acre barley; thus, they are becoming self-sufficient in their feed grain needs.

Senator HARKIN. Well, if they are supporting the price of corn at $5.60 a bushel in Europe, we can beat that price. Why aren't we shipping corn into Europe?

Mr. SCHNITTKER. Senator, you cannot beat that price because of their system. You take $2.40 corn in Iowa; let's add $1 a bushel to Rotterdam. That is $3.40 corn, but before you can get it to any user, they have to pay a huge levy to get in the Community——

Senator HARKIN. Oh, so they have protective devices.

Mr. SCHNITTKER. Right. You cannot compete with them because of their system.

Senator HARKIN. Well, there, Senator Boschwitz, there is your answer. Why don't we do unto them like they do unto us?

That is my point, you see.

Dr. DUNCAN. I am not so sure it is as simple as that, although I very well understand they have a protected marketplace.

By the way, that protection has not prevented their own farm real estate values from beginning to decline. Their asset values in agriculture are declining for the same reasons they are in this country.

Senator BOSCHWITZ. What is the cost of their agricultural programs?

Dr. DUNCAN. It is an immense cost. I do not have exact figures at hand.

Senator BOSCHWITZ. In the middle, $30 billion.

Dr. DUNCAN. They are constantly on the ragged edge of not being able to provide that funding. A point that we sometimes miss is that there are other producers in the world who can and do produce food and fiber as cheaply as the United States. And that may be true in parts of the EC. It may also be true in parts of Latin America. It is tough to face up to.

Senator HARKIN. I am sorry I have to go; I have my bank people out here.

But I have often wondered if you people have ever looked at a Western Hemispheric Common Market with our Latin American friends, with the Argentinians, the Brazilians, and the Canadians.

Senator BOSCHWITZ. We are the producers.

Senator HARKIN. We are the producers, yes, but we ought to have some kind of a common production——

Senator BOSCHWITZ. Who are we going to sell it to? We had better include them in this market, in which case, you pretty well get the whole world. I will come around, and we will talk about it, because I had assumed that our attitudes were a little bit different, and I would like to talk to you about it to see if we can understand one another's viewpoints. We are neighbors.

Senator HARKIN. Yes. Our farmers are not that much different.

Senator BOSCHWITZ. Your farmers have had more problems, I think, because your land values escalated——

Senator HARKIN. And we had bad weather, too, but that is another thing. Thank you very much. I am sorry I have to leave, but thank you.

APPENDIX

MARCH 12 HEARING—STRUCTURE OF AGRICULTURE

STATEMENT OF DR. DON PAARLBERG, PROFESSOR EMERITUS, PURDUE UNIVERSITY, LAFAYETTE, IN

My name is Don Paarlberg. I am professor emeritus of Purdue University. Half my professional life has been spent in the Purdue School of Agriculture and the other half in the Federal Service, most of it in the Department of Agriculture. I am now self-employed, consulting and writing.

My subject is the structure of agriculture, by which I mean the institutional arrangement whereby land, labor, capital, and management are combined to produce crops and livestock. I shall describe the present structure and the trends that are underway. Next I shall consider some of the causes of change and speculate on where these trends might lead. I shall then discuss what might be done to modify these trends if it is considered desirable to do so.

Since 1930 enormous changes have occurred:

Tractor horsepower has increased 11 times.

Farm output per man-hour of labor has risen to 14 times its earlier level.

The acreage of land cultivated per farm worker increased five-fold.

From 1930 to 1974, thirty-three million people left agriculture.

The number of farms reached a peak of 6.8 million in 1935 and is now only a third of that number, 2.2 million.

In 1930 farmers numbered about 25 percent of the farm population; today they constitute less than 3 percent.

Tonnage of fertilizer used has increased 15 times.

Crop production per acre has more than doubled.

Since 1950, agricultural assets have increased two and a quarter times, in real dollars.

To raise the necessary capital, farm debt increased, in real terms, about 5 times.

Output per unit of input—that is, overall efficiency—increased to two and a half times its earlier level.

Land holding has become more concentrated. In the North Central States in 1978, three-tenths of one percent of the owners held 23.5 percent of the land.

These profound changes have affected both farmers and non-farmers. Forty years ago per capita incomes of farm people averaged only 37 percent as high as those of non-farmers. By 1982, they had risen to 78 percent. Consumers have also gained. Forty years ago it took 34 percent of personal consumption expenditures to buy food; today that percentage is only 19.

I elaborate, now, some of the more subtle changes that have occurred, not so apparent, perhaps, as those previously named.

LOSS OF HOMOGENEITY

In an earlier day farms were reasonably similar to one another, so that agricultural legislation could with some logic be considered appropriate to the whole of the industry. But now we have a three-sector agriculture:

Large farms, with more than $200,000 in gross sales, constituting 4 percent of all farms, producing 48 percent of the total output, having, in 1983, an average net worth of $1.6 million, on the whole doing rather well.

Small farms, with less than $40,000 in gross sales, comprising 72 percent of all farms, producing only 13 percent of the output, most of them losing money on their farming operation and making it up with off-farm income.

Medium farms, with gross sales from $40,000 to $200,000, comprising 24 percent of the farms and producing 39 percent of the farm products. These farms are large

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enough so that the operator finds it hard to take off-farm work, but they are not large enough for the operator to earn the kind of living considered appropriate in today's America.

It is now very difficult to write farm programs that have general application to farms so diverse from one another.

CONCENTRATION

Production of certain products is now much more concentrated. In 1982, beef cattle operators with sales of over $500,000 per year represented only one half of one percent of all beef cattle operations but accounted for 55 percent of the total value of cattle sales. In 1977, the 16 largest broiler producers and contractors controlled about 50 percent of the production. These are exceptional enterprises. For most farm products the degree of concentration is much less.

VERTICAL INTEGRATION

A firm is said to be vertically integrated when it controls two or more levels of the production-marketing system. Formerly production of input items, farm production, marketing, and processing were separate and distinct. Farm products were sold competitively in central markets. We have come a long way from the old system. In 1981 it was estimated that 32 percent of farm sales were vertically integrated, sometimes by contract and sometimes by ownership.

SPECIALIZATION

The general farm was once common but is becoming less so. Modern technology involves expensive specialized equipment for each enterprise. So instead of growing corn, oats, and hay, and keeping hogs, cattle, and a flock of laying hens, the typical farmer concentrates on one or two enterprises.

PART-TIME FARMING

An amazing thing has happened. In 1982, 64 percent of the incomes of people classified by the census as farmers came from non-farm sources.

INCORPORATION

To cope with the enormous capital requirements of modern agriculture, farmers set up family farm corporations. This facilitates passage of the farm from one generation to another and has some tax advantages. In 1974, the most recent available date, family farm corporations had 1.3 percent of the farms, 7.8 percent of the land in farms, and produced 9.1 percent of the farm product sales.

Some publicly-held corporations have come into agriculture, chiefly for specialty products. Though they are frequently cited as a threat to the traditional farm, they accounted, in 1974, for only .06 percent of the farms, .6 percent of the land in farms, and 3.4 percent of farm product sales.

MORE VULNERABILITY

In earlier years farmers produced much of their own fuel, fertilizer, seed, and labor. Now most of these inputs are bought so that the margin between receipts and expenditures has been squeezed. In a good year net income can easily be doubled and in a bad year wiped out altogether.

TENURE

Part-owners, who own part of their land and rent additional land, are in increasing proportion of the farms. In 1974 they totaled 27 percent of all farms and accounted for more than half of the land in farms. The amount of land operated by full-owners and full-tenants has declined dramatically.

There are sharp arguments about the causes of these trends. Clearly the dominant cause is technology, which calls for increased size of operation, much more capital, and more sophisticated management. Institutional forces have had their effect; tax policies and public credit programs have made larger farms. Research and education programs, with their cafeteria-style offerings, have been picked up more readily by the larger operators and have speeded up rates of change. There is disagreement as to the effect of the commodity programs on size of farm. Most operators of big farms contend that the programs have no effect on farm size. But in the next breath they will say that putting a low cap on government payments per farm would result in breakup of big farms. I am more convinced by the latter agrument than the former. A fair summary of the issue is that whatever may have been the effect of the commodity programs, it was overwhelmed by effect of other forces.

I now turn to the future; what will be the structure of agriculture in the years ahead? The analysis thus far establishes technology as the major cause of structural change, so if we can anticipate change in technology we should be able to foretell structure.

Every available sign indicates that the pace of technological change is likely to increase during the balance of the century. A preliminary study by the Office of Technology Assessment projects the "most likely" percentage increases from 1982 to the year 1990:

	Percent increases
Crops, yield per acre:	
Corn	3.4
Cotton	6.9
Rice	5.7
Soybeans	7.3
Wheat	9.3
Livestock, output per unit:	
Beef:	
Meat per pound of feed	2.3
Calves per cow (lbs.)	4.8
Dairy:	
Pounds of milk per pound of feed	1.1
Milk per cow per year	13.8
Poultry:	
Pounds of meat per pound of feed	20.5
Eggs per layer per year	5.3
Swine:	
Pounds of meat per pound of feed	3.0
Pigs per sow per year	5.6

In animal production the five leading nominees for major technology thrusts are: genetic engineering, advances in animal reproduction, growth regulators, better animal nutrition, and disease control. In crop production, the five leading candidates for technological advance are: genetic engineering, enhancement of photosynthetic efficiency, plant growth regulators, plant disease and nematode control, and management of insects and mites.

The OTA analysis produces the not surprising finding that the trends discussed above are likely, in the absence of major public policy initiatives, to continue in the years ahead much as they have in the past. The agricultural revolution has not yet run its course.

Are these trends good or bad? There is a division of views. It is probably correct to say that most people feel that the trends are moving too fast, placing excessive strain on the social structure, and that they should be slowed. Some say they should be allowed to work themselves out without the intervention of public policy. Very few people think that public policies should be adopted to speed them up.

I next lay before you, without advocacy, 11 farm policy initiatives that have variously been offered as way of slowing or reversing the trends underway. These are arbitrarily divided into those that are likely to be ineffective and those capable, if enacted and implemented, to change the course of events.

Proposals that would be unlikely to slow or reverse structural changes now underway

I have chosen six of these.

1. *Continue or increase farm price supports.* Despite the purposes professed in the preambles to the various Agricultural Acts, price supports give most of their benefits to the large farms. In 1983, forty-four percent of the benefits went to the top 12 percent of the farmers. Price supports have not "saved the family farm" nor will they do so.

2. *Prohibit farming corporations.* As has been shown, corporations are not a major rival to the privately-held farm and outlawing them would have little effect on the trends previously discussed.

3. *Prohibit vertical integration and contract farming.* To outlay vertical integration and contract farming would deprive farmers of an assured home for their products with known terms of sale. It is hard to see how this could affect farm structure for the better.

4. *Prohibit purchase of land by non-farmers.* With farms increasing in size and capital needs growing, the investment per farm grows so large as to be out of the

reach for all but those of fortunate family circumstances. Outside capital must come in. Ownership of land by non-farmers and its intelligent leasing to farm operators is a way of helping young men get started. Ruling out this possibility is to eliminate a remedy, not an ailment.

5. *Cheap credit.* Much of agriculture's present problem is the result of easy credit and excessive borrowing during the late 70's and early 80's. It is hard to see how open-handed credit would solve a problem that it in part created. Nor would it slow the trends discussed earlier, particularly since however subsidized credit is intended, most of it winds up in the hands of the big farmers.

6. *Government purchase and lease of farmland.* This has attractiveness as a ways of helping young farmers get started. It would give government an opportunity to influence structure, but not without complications. Government would determine to whom farming opportunities should be granted and from whom they should be withheld. It would reverse the land policies of most of American history.

Proposals that would change structural trends

If there is sincere intent to slow down or reverse trends in the structure of agriculture, there are ways of doing it.

1. *A progressive tax on farm real estate.* A progressive tax on farmland would check or reverse the trend towards fewer and larger farms. It would relate to accumulated land wealth in land much as the progressive income tax relates to the annual flow of wealth.

2. *Tough inheritance laws.* Instead of making it easier to pass large farms intact from one generation to another, as was the purpose and effect of recent legislation, such taxes could be increased with the objective of breaking up large farms. This would require sale of part of the land to pay the tax and would give a young man a chance to buy land and start farming.

3. *Change other tax laws.* Various institutional arrangements favor the large farmers. These are: cash-basis accounting, preferential taxation of prospective capital gains, deductability of interest on borrowed funds, investment tax credits, and several methods of computing accelerated depreciation. All of these give subtle preference to big farmers, who use enormous amounts of capital. These tax provisions could be withdrawn.

4. *Targeting government programs.* Instead of relating farm program benefits to the number of bushels produced, which favors the larger farmers, they could be targeted to those farmers in the middle range of size, described earlier.

5. *Re-order research and extension.* The trends previously documented are mostly the result of technology. New technology results from research and education. Research and education, about half of which are funded by the public, have speeded the substitution of capital for labor and contributed to the observed trends. If research and education were shifted away from high technology, toward intermediate or low technology, the trends could be slowed. This would mean curtailing basic research, helping develop farming systems for small and part-time farmers, and working with cooperatives that pool buying and selling power for farms of small or moderate size.

The gist of this testimony is as follows:

1. Structural changes are so profound as to constitute a veritable revolution.
2. They have deep-seated causes, the dominant one being technology, which, if anything, seems to be accelerating.
3. These structural changes are a cause of public concern.
4. There are effective ways of slowing or reversing these trends but they are so unattractive that they are unlikely to be adopted.
5. We are likely, therefore, to continue our ambiguous course: Continuing to promote these changes by our public policies. But nevertheless lamenting them for their social effects, real and alleged.

MARCH 14 HEARING—LOAN RATES, TARGET PRICES, SUPPLY MANAGEMENT, AND PRODUCTION CONTROLS

Statement of Hon. Jesse Helms, a U.S. Senator From North Carolina

Today the Committee is holding the second of a series of thematic hearings regarding agricultural policy. It is the first time I know of that any Congressional Agriculture Committee has undertaken these kinds of hearings to study and assess what impact farm programs and policies have on the American agricultural industry.

I found our first hearing on Tuesday that examined the structure of agriculture to be extremely helpful. Generally speaking, Senators in attendance participated in a bipartisan fashion and came away, I'm sure, with a better understanding of the structure of the agriculture industry and the impact farm programs have on the industry as a whole.

It is my profound hope that Senators will listen openly to our distinguished panel of expert witnesses today and ask relevant questions in a constructive manner as was done Tuesday.

Our topic today is loan rates, target prices, and production controls. Since the Agriculture Adjustment Act of 1933, commodity loans and production controls have been the fundamental farm policy instruments or tools. Direct income transfers in the form of target prices with deficiency payments are a relatively new policy tool even though the concept was proposed by Harry Truman's Secretary of Agriculture Charles Brannan in 1949.

Today, the effectiveness of these policy tools is being called into serious question. There is almost unanimous agreement that present farm policy tools and programs are not working and that a new approach to farm policy is needed.

Why aren't they working? Most analysts agree they are not working because agriculture is now part of a global business economy and is subject to forces generally beyond the control of the Secretary of Agriculture, the House and Senate Agriculture Committees, and even the President of the United States.

Prior to the Great Depression, income from agricultural exports accounted for as much of total farm income proportionally as it does today. However, when trade collapsed as a consequence of the Great Depression, agriculture become purely a domestic industry. It was not until the 1970's that agriculture reemerged in any large way as a major export industry.

We need to better understand the nature of the economic environment in which agriculture finds itself now, and how our current policy tools—nonrecourse loans, target prices with deficiency payments, and production controls—do or do not fit into the present marketing and structural situation of agriculture.

Many analysts agree that commodity loan rates above market-clearing levels stimulate production both at home and abroad, while putting American farmers at a disadvantage in the export market. Surpluses accumulate because crops cannot be sold. This puts downward pressure on farm commodity prices. Calls then come forth for production controls to artificially support prices and to try and improve farm income through this kind of intervention. These actions, if taken, compound the problems farmers have and result in pressure for even more Federal intervention in the business of farming. Then, the downward cycle begins all over again.

Of course there are other factors to consider such as trade, fiscal, and monetary policies. However, except for some limited trade programs, these policies are outside the jurisdiction of the Senate Agriculture Committee. Therefore, we need to examine and understand just how the policies within our jurisdiction affect the total agricultural complex, as well as individual producers.

Examination of the causes and effects inherent with manipulation of the agricultural economy is why these hearings are being held. I look forward to the testimony and dialogue about to get underway.

STATEMENT OF HON. EDWARD ZORINSKY, A U.S. SENATOR FROM NEBRASKA

Mr. Chairman, there has been much discussion about the merits of a so-called "market-oriented" farm bill. Support for such a proposal seems to be based on three premises:

One, that the traditional programs are total failures and must be discarded;

Two, that a "free market" will provide a sufficient price to farmers; and

Three, that government expenditures must be curtailed.

I am not convinced that the farm programs of the past were without some success—if for no other reason than that they provided American consumers with the cheapest, most bountiful food supply in the world.

In addition, the suggestion that a free market will provide a sufficient price to our agricultural producers is based on the erroneous assumption that such a free market actually exists for agricultural products.

As I have stated before, I will support a "market-oriented" program if and when we are dealing with a free market international economy.

Finally, the administration—through Mr. Stockman—has made clear its intention that a disproportionate measure of the responsibility for reducing the budget deficit will be borne by farmers. The fact that such a burden is being imposed at a time when farmers can least afford it makes the imposition doubly onerous and unacceptable to me.

I would hope that the 1985 farm bill, if it accomplishes nothing else, will ensure that the consumer—not the farmer—increases his or her contribution to stabilizing the agricultural economy.

Toward that end, it is my sincere hope that we will not rush to discard programs that may work—if strengthened and administered in a fiscally responsible manner—only to replace them with programs that could be harmful to our family farm system of agriculture.

I look forward to reviewing the testimony of today's witnesses.

STATEMENT OF HON. PATRICK J. LEAHY, A U.S. SENATOR FROM VERMONT

Mr. Chairman, this hearing will be an important step toward reauthorization of farm programs and I am pleased the full committee has begun hearings.

This hearing will assist and focus on the Senate Agriculture Committee's efforts to establish sound and workable agricultural policy for years to come.

Farmers face a multitude of problems. They have to cope with high interest rates and rising production costs. But, in addition, farmers have to contend with constantly changing programs that make long range planning an impossibility. And, family farmers believe they are being told by unsympathetic officials in Washington to "get big or get out." I think a different message should be going forth.

A sound and consistent farm policy can help farmers meet today's challenge, and I think we can do better than the farm program proposed by the administration. Two weeks ago, I asked Secretary Block to name one farm organization that supported his dairy proposal in the administration's farm bill. As the Washington Post reported, he was stumped. He couldn't name one—not one.

I recognize that some programs need to be adjusted as we learn from experience. Adjustment is different from termination.

Mr. Chairman, I look forward to today's testimony.

STATEMENT OF DR. RONALD D. KNUTSON, PROFESSOR, AGRICULTURAL AND FOOD POLICY CENTER, TEXAS A&M UNIVERSITY

My name is Ron Knutson. I am a professor in the Agricultural and Food Policy Center in the Department of Agricultural Economics at Texas A&M University. The Center was created by our Board of Regents to conduct research and educational programs on issues of public policy in agriculture.

The purpose of my testimony is to assess the need for, status of, place of, and potential for the effective use of supply management policies in agriculture. Supply management programs are among the most frequently misunderstood in agriculture. That misunderstanding results largely from their lack of effective and judicious use.

In agriculture, supply management generally engenders polar extreme views of either the free market or the mandatory production control advocate. I do not represent either extreme.

I find it curious that in the remainder of the American economy firms produce to meet the needs of markets—not to generate surpluses. If surpluses accumulate, they cut back on production. If firms overadjust, they lose markets—a recognized result of mismanagement. No one questions the desirability of such adjustments. And the concept of managing or tailoring supplies to market needs is seldom questioned.

In agriculture, suggestions that production might also be tailored to market need are strongly criticized. The standards are somehow different. Marketing orders that manage supplies in any form are viewed, increasingly, with disdain by policymakers. Insufficient distinction is made between policies designed to temporarily bring supplies in line with market needs and those designed to curb production in a longer run context.

THE NEED FOR SUPPLY MANAGEMENT POLICIES

Agriculture is an inherently unstable industry. With favorable weather it has great capacity to produce in excess of effective demand. It is instability, more than anything else, that justifies farm programs. Judicious incremental use of supply management policies consistent with the level of surplus stocks can help to reduce the degree of instability—that is, help prevent periodic boom and bust conditions in agriculture. Without judiciously employed supply management policies, as a standby policy tool, costly large scale storage and/or production control policies result—such as the farmer owned grain reserve and the PIK program.

The sources of agriculture's instability are many and are beyond the control of farmers. The vagaries of weather are compounded by changes in the value of the dollar, the agricultural and trade policy decisions of other countries, embargoes, and changes in domestic farm policy. In a free market agriculture, the firms that survive will be those that are able to employ the skills required to cope with a high level of risk and uncertainty. Moreover, a typical reaction to risk is the development of integrated systems of production that are not typical of the decentralized farming that characterizes production of the major crops. These will not be average family farmers.

Over the past 15 years, agriculture has experienced a periodic series of surplus and deficit conditions. Contemporary studies such as that done by Resources for the Future (RFF) suggest this will be the condition through the year 2000—accentuating the instability problem in agriculture. Under these conditions, the need for supply management policies will be of a periodic nature.

However, there is another school of thought that believes that studies such as RFF have not properly accounted for the impact of emerging technologies on farm productivity. American agriculture is entering the biotechnology era—an era where the rate of increase in agricultural output is likely to accelerate. For example, an Office of Technology Assessment study indicates the potential for nearly a 20% increase in the rate of change in corn and wheat output—a considerably faster rate of increase than the market can absorb at acceptable prices.

Globally, agricultural output is rapidly increasing in a number of major food producing and/or exporting countries. For example, China has increased the output of cotton by 72% in the past four years. Wheat and coarse grain acreage in Canada, Australia, and Argentina has increased 22% since 1981. China and India used to be importers of grain but are now exporters. Over the next 10 years with a full production strategy combined with technological infusion, it is easy to visualize grain exporting countries increase output in excess of 50%. It is very difficult to see how the market can absorb that magnitude of increase. Developing countries also have the ability to substantially increase yield based on known technologies. Developed countries have wheat yields that average 53% higher than those in developing countries.

Within the United States there is tremendous potential for increased productivity. Less than 5,000 well managed dairy farms of the scale typical of Southwest dairying could produce all of the milk sold commercially in 1983 by over 300,000 dairy farms. USDA data confirm that these farms are rapidly becoming the most efficient in the United States and are in the best position to apply new technologies such as computerized feeding, embryo transfer, and bovine growth hormone technology.

The point of this discussion is to suggest that surplus conditions will, in all probability, be considerably more common in the years ahead than deficits. Agriculture is very likely headed back into the chronic surplus conditions that existed in the 1950s. Given this scenario, the need for supply management policies is greater than in the past decade. Without the power to adjust supply to market needs, we should expect turmoil in agriculture over the next two decades.

TWO ADJUSTMENT ALTERNATIVES

When surpluses develop there are two basic alternatives for adjustment:

(1) Rely on the marketplace to lower farm prices and force excess capacity out of agriculture. Those farmers forced out of business are likely to be the ones with the highest cost of production—which in times of high interest expenditures probably means the farmers having the highest debt, not necessarily the least efficient. The effects of farmers going out of business will extend beyond the farm gates to the financial and employment base of rural communities. Another exodus will occur from rural America to the cities—with few opportunities in the cities for employment.

(2) Remove excess capacity from the marketplace through a supply management program. Such a program should be designed only to bring supplies back in line with market needs—domestic and foreign. It should not short the market in an effort to support farm income; rather it should remove the burden of surplus commodity stocks and prevent prices from falling to unacceptably low levels. To do this a combination of voluntary short and long-term land retirement programs is suggested.

To pursue a policy in agriculture on the false premise that there is no difference between the behavior of the agricultural economy and the remainder of American industry would be a serious mistake. A free market for only farmers would be a lopsided policy that would result in great economic and social turmoil. What assurance is there that when American agriculture moves to a free market the remainder of the world will pursue a free trade policy? Adjusting unilaterally could put agriculture in an even worse position.

IMPROVING THE EFFECTIVENESS OF SUPPLY MANAGEMENT POLICIES

In analyzing the effectiveness of supply management policies, it is important to distinguish between programs that mandate participation and voluntary programs where producers have a choice. At the end of this paper is a summary of the major supply management policy tools from a recent publication titled "Alternative Policy Tools for U.S. Agriculture" from our policy center. The most effective supply management programs involve mandatory regulation of the quantity of product marketed—marketing quotas. However, marketing quotas are contrary to an economic and political system that favors voluntary participation. Mandatory programs, while low cost to taxpayers, impose substantial, frequently unnoticed costs on both producers and consumers.

Adverse quota effects

Quota systems increase costs, foster inefficiency, and destroy markets. When quotas substantially increase producer prices, the benefits are capitalized into the value of the quota itself. Canada's milk and egg marketing board quota policies provide two excellent examples. In Ontario and Quebec, USDA found that quotas acquired for the right to market milk in 1983 cost between $2,540 and $3,327 per cow ("Dairy Outlook and Situation", Dec. 1984, p. 34). A comparable egg quota program has led to reported quota costs of $30 per hen. Such quota costs become a windfall capital gain to initial quota holders. Subsequently, quotas become an additional element in the cost of production which, of course, eventually is passed on to consumers.

Quotas distort the price mechanism and result in a misallocation of resources. Prices are normally higher than the market will tolerate and this creates the incentives for market destruction. Markets are destroyed as the production of substitute products is encouraged by higher product prices. A classic case of such market destruction is occurring in sugar where the use of import quotas has raised domestic sugar prices four to five times higher than world market prices. This has had the effect of encouraging the substitution of corn syrup and noncaloric sweeteners for sugar.

Marketing quotas can likewise have the effect of reducing exports while inviting imports. When the effect of marketing quotas is to raise domestic prices above world prices, exports decline—as is the case when loan rates rise above world prices.

The adverse effects of quotas are not inherent in all supply management strategies. They are most pervasive when production controls are pursued as a continuous, vigorous, long-term strategy. There is no reason to anticipate the same degree of adversity when supply management strategies are pursued as a voluntary policy to reduce instability if surpluses accumulate. It certainly makes more sense to curb supplies in times of particularly favorable weather, adverse economic conditions, or trade restraints which result in surplus conditions rather than to store excess stocks. The storage strategy was attempted in the two years prior to PIK and clearly did not work.

PROBLEMS WITH PAST VOLUNTARY DIVERSION PROGRAMS

The history of success on voluntary production control programs is not particularly good. A rule of thumb has developed which states that if 15% of the land devoted to a particular crop is taken out of production, the quantity produced will decline by only 3% (80% slippage). The reason for such high slippage levels lies in three primary factors:

(1) Diversion has been applied on an individual commodity basis. As a result, farmers have been able to choose to participate on one crop and not on another. On a typical farm, there is always some low productivity land that can be put into the diversion program.

(2) Diversion programs have been applied on an individual farm basis. As a result, farmers have been able to participate on farms having poor production conditions while not participating on farms having favorable production conditions. Such a policy has been justified on the basis of flexibility and the problems tenants have in getting all landlords to participate in the program. The cost, however, is reduced program effectiveness.

(3) Program administration has been lax. Initial decisions on diversion requirements have been delayed on the hope that surplus conditions would pass. When programs have been implemented, they have generally been too late and too little. Once the decision has been made to implement, insufficient care has been taken to ensure full compliance with diversion requirements.

In addition to failing the test of effectively controlling production, past diversion programs have also failed to protect the environment. They have not taken the most fragile land out of production. If anything they may have encouraged fragile, highly erosive land to be brought into production so that it may subsequently be diverted. Even though individual participating farmers may take their least productive land out of production, that is not necessarily the most erosive land.

HOW TO MAKE SUPPLY MANAGEMENT EFFECTIVE

To be effective, supply management programs must be in a position to both stabilize production in the short-run and deal with the potential for long-run excess capacity in agriculture. One way of accomplishing these dual objectives is through a combination of year-to-year voluntary diversion programs, a longer range land retirement program, and a sodbuster provision that discourages bringing new land into production. For such a program to be accepted, substantial improvement is required to (1) improve timing of application, (2) minimize slippage, (3) contain sufficient incentive to encourage participation, (4) reduce costs, and (5) be consistent with the achievement of conservation policy goals.

Proper timing

Timing is crucial to the effectiveness of voluntary supply management programs. Without proper timing, surplus commodity stocks continue to accumulate and costly PIK type programs result.

One way to avoid timing errors is to provide for a supply management trigger in the farm bill. The trigger would initiate a diversion program when the ratio of commodity stocks to use rose above a specified level.

The appropriate level of the trigger is determined by the price objective of the program. If the objective is simply to prevent large wheat stocks from accumulating, it is easily documented that once the stocks/use ratio rises above 40%, prices tend to settle at the support level and there is a high probability that the government will acquire large stocks of wheat. To avoid such a takeover, a 40% stocks/use ratio trigger might be used to initiate a 15 or 20% diversion.

In cases where the initiation of a 20% diversion program fails to bring supplies back into line with needs, sufficient evidence exists to initiate a longer-term land retirement program as discussed later under the achievement of conservation goals.

Minimizing slippage

If farmers were required to participate on all crops (cross compliance), the effectiveness of the program would be considerably enhanced. Instead of simply requiring cross compliance, it would be more effective and efficient to simply establish a total cropland base for each farm and take a certain percentage of the farm's cropland out of production, rather than diverting 15% of the base acreage for a particular crop. The 15% diversion could be initiated in the event that the wheat, cotton, or corn stocks/use ratio rose above any of their respective trigger levels. Since the program is voluntary, incentives for producers to participate would vary depending on market conditions for the individual crops. Therefore such a diversion concept would not run the risk of shortage on any individual crop.

Such a strategy would allow the overall surplus problem to be more effectively dealt with by preventing the surplus from being transferred from one crop to another. This suggestion encourages a more optimal allocation of resources and crop mix than a fixed diversion rate for each crop. This is because it causes farmers to allocate resource use and crop mix based solely on expected prices and marginal cost, given the total number of acres to be diverted.

In addition, farmers could be required to participate on all farms (offsetting compliance). The result would be increased assurance that a farmer's participation is not limited only to unproductive land.

Minimizing slippage also requires a high level of farmer participation in supply management programs. If program benefits are to be used as the inducement for participation, those benefits must be large enough to encourage widespread participation by farms of all sizes. Payment limitations have been the major deterrent to participation in diversion programs by large-scale farmers.

There is increasing concern that one of the effects of diversion programs and increased income support for agriculture has been the attraction of new production capacity into agriculture. Such new capacity should not be allowed farm program price and income protection. Nor should newly broken land be used as diversion land in either land retirement or diversion programs.

Minimizing cost

One of the criticisms of diversion programs has been that they constitute a double tax on consumers in that the consumers pay taxes to take land out of production and then pay again at the supermarket in terms of higher food prices. One method of avoiding the taxpayer cost of diversion programs is to put them on a self-financing basis. Self-financing has been reasonably effectively utilized in milk—and with tighter administrative procedures could have been even more effective.

In milk $0.50/cwt. has been checked off by the first handler. The receipts have been used to pay dairymen who contracted to reduce production by specified amounts. This procedure has effectively reduced the cost of the dairy program while dealing with the problem of the producer who desires the benefits of supply management but prefers not to pay the costs.

Similar procedures could be applied to other price and income supported commodities. A checkoff of say $0.05 could be taken for each bushel of wheat produced. The result would be a zero cost diversion program, unencumbered by payment limitation procedures. Alternatively, the government could match the diversion payments of farmers as its contribution to the achievement of conservation program objectives.

Diversion program costs could be further reduced through the application of bid procedures on land taken out of production. Such procedures could easily be applied to longer-term retirement programs, but with proper planning could also be used on annual diversions.

Achieving conservation goals

Diversion programs can also be employed to achieve conservation objectives. One method of accomplishing increased conservation effectiveness is to apply more stringent erosion control requirements to diversion (conservation cross compliance).

A second alternative involves targeting diversion programs to the most erosive farmland. This is particularly relevant to the longer-term land retirement programs. Available data indicate that 53% of the soil erosion occurs on 11% of the farmland. If diversion policies were limited to that 11% of the most erosive farmland, conservation policy objectives could be achieved while pursuing supply management objectives. If this were done in the assessment or self-financing framework, both diversion and conservation objectives could be accomplished at zero cost to the government.

CONCLUDING COMMENTS

In times of surplus production, market prices signal the need to move resources out of production. This can be accomplished either by a survival of the fittest system or by an effective supply management strategy. The market does not care as long as resources are removed. Society might quite rationally decide to act more humanely.

As a general rule, economists have expressed substantial aversion to supply management programs. This aversion results, in part, from a lack of sensitivity to the range of production control possibilities and the potential for effective management of supplies. Firms throughout our economic system manage supplies without destroying their markets. Agriculture can as well without the economic and social costs involved in free market adjustment—if the tools are provided to accomplish this objective.

Policy Tool: Marketing Quotas (and Certificates).

Policy Area: Domestic Farm Policy, Supply Control.

What It Is: A marketing quota is a mandatory mechanism which determines the quantity of a commodity that can be marketed. The national quota, set by the Secretary of Agriculture, is based on expected domestic and export demands. It is usually below normal production levels but high enough to satisfy the Secretary's estimate of expected market needs. Each producer is given a portion of the national quota based on his past production. Marketing quotas are the most effective means of controlling production.

Objective: To restrict production by controlling the quantity farmers are allowed to market.

When Used: Since marketing quotas are mandatory for all producers growing the quota crop, a two-thirds majority of farmers voting in a referendum must approve the quota. Once approved, the quota is effective for only one crop year. To be continued for a second year, it must be approved, in a second referendum. Farmers historically have approved a quota only when a crisis existed. Quotas are generally used in conjunction with relatively high price supports to encourage producer acceptance. Marketing quotas have been used regularly for peanuts and tobacco.

Experience: Marketing quotas have effectively reduced production and stock levels but only when the national quota was set at levels consistent with demand at politically acceptable prices.

Consequences: Once a quota is in place, there is pressure to increase the national quota, thus counteracting its purpose.

Like other supply control programs, marketing quotas usually reduce the volume of exports for the quota crop.

Marketing quotas are more efficient in reducing supply and raising price than acreage reduction programs because there is almost zero slippage. (Slippage is that portion of reduced acreage which does not result in correspondingly lower production; e.g., due to removing the poorest land.)

Marketing quotas are associated with low treasury costs unless the quota is so high that CCC stocks accumulate.

Because of the annual referendum requirement, marketing quotas create uncertainty for producers. This could be changed by legislative action making quotas effective for 4 years.

Marketing quotas tied to a land base tend to be capitalized into the land and result in increased land prices.

Single crop marketing quotas for major crops (e.g., wheat) adversely affect prices of crops planted on the idled acres (e.g., corn and sorghum).

Increased prices for commodities increase cost of production for livestock producers and food prices over time.

Policy Tool: Acreage Reduction (Set-Aside and Diversion).

Policy Area: Domestic Farm Policy, Supply Control.

What It Is: Acreage reduction consists of an acreage set-aside and/or acreage diversion that is generally voluntary. Acreage set-aside programs require that participating farmers idle a percentage of their crop base acres to be eligible for other program benefits, while acreage diversion programs pay producers a given amount per acre to idle a percentage of their base acres. A farmer's base acres are determined by the production history of the crop.

Objective: To reduce the quantity produced and thus the supply of a given commodity.

When Used: Acreage set-asides and diversions were used extensively during the 1960s and intermittently since 1977. These programs are generally used when prices are depressed due to a build-up of stocks.

Experience: Acreage reduction programs have been only modestly effective in reducing supply over the long run. These programs have usually been used when high loan rates, or target prices, or even temporarily high market prices encourage producers to increase production. Except for cotton and rice, acreage reduction programs have usually had relatively low producer participation. To encourage participation, diversion payments to supplement other farm program benefits may be added.

Consequences: To the extent that they reduce production, acreage reduction programs reduce supply, stocks, and raise prices domestically.

Effective acreage reduction programs reduce the volume of supply available for export.

Slippage, reduces the effectiveness of the program.

Diversion programs can result in large treasury outlays.

Payment limitations and offsetting compliance discourage participation by large-scale operators who farm large acreages for several landlords.

Failure to require cross compliance encourages producers to participate for one crop but not for others—reducing the effectiveness of the overall program.

Benefits from acreage reduction programs get bid into the price of land.

Acreage reduction programs tend to restrict ability of farmers to shift acreage in response to changes in relative crop prices.

Increased prices for commodities increase cost of production for livestock producers and food prices over time.

Policy Tool: Long-Term Land Retirement.

Policy Area: Domestic Farm Policy, Supply Control.

What It Is: Long-term land retirement is a multiple year voluntary program that removes cropland from the production of farm commodities.

Objective: To remove from production cropland that is devoted to crops in surplus or is subject to erosion.

When Used: The program was first authorized in the Agricultural Act of 1956 as the Soil Bank program. In 1965 Congress re-established a land retirement program and called it the Cropland Adjustment Program. Funding was authorized for continuation of a long-term land retirement program in 1970. Land retirement is acceptable to consumers and producers only when surplus stocks and low prices are a chronic problem. If needed, the land can readily be put back into production, as it was in the early 1970s.

Experience: Land retirement programs removed large quantities of cropland from production in the Great Plains. Cropland under long-term agreement was put into a conserving use (usually grassland) and was considered a national food reserve. Only the least productive lands were enrolled in the program. Because of the regional concentration of enrollment, the program was blamed for the demise of numerous rural communities. Sealed bids for long-term land retirement can be used to remove cropland from production without over- or under-paying operators to remove their land.

Consequences: Long-term land retirement is a supply control and conservation strategy that costs less than paying storage and interest for grains already produced.

Long-term land retirement programs can adversely affect local agribusiness and rural communities.

Treasury costs are lower than they would be for annual diversion of the same acreage for the same number of years.

Increased prices for commodities increase production costs for livestock producers and food prices over time.

Land retirement can be used to encourage conservation of cropland and enhance wildlife preservation practices.

Long-term land retirement reduces farmers' flexibility.

Retired land, properly cared for, results in greater productivity when put back into use, thus possibly exacerbating the excess supply problem.

Slippage is generally high because least productive land is removed from production. Slippage may be reduced somewhat if whole farms are removed from production.

Policy Tool: Acreage Allotment.

Policy Area: Domestic Farm Policy, Supply Control.

What It Is: Acreage allotment is a mandatory mechanism to reduce the quantity supplied. Acreage allotments require that producers plant within a specified amount of land. The number of allotment acres for each farmer is set at a given percentage of the farmer's production history. The percentage is set to achieve the desired reduction in production and thus in quantity supplied.

Objective: To reduce the quantity produced and thus the supply of a given commodity.

When Used: Acreage allotments were used extensively during the 1950s and 1960s for the basic commodities. Allotments still exist in tobacco and for peanuts eligible for price supports. Allotments have also been used as a means of allocating target price benefits (e.g., with rice from 1976 through 1981).

Experience: When acreage allotments were used alone (in the absence of marketing quotas) farmers responded by farming the allotment acres more intensely, thus raising yields. The result was a tendency for production to return to pre-allotment levels, therefore necessitating futher restrictions on allotment size. In some commodities, such as tobacco, marketing quotas were imposed to obtain firmer control over production.

Consequences: Acreage allotments raise domestic prices by reducing production and supply.

Benefits from acreage allotment programs are bid into the price of land and/or allotments.

Acreage allotments restrict ability of farmers to shift acreage in response to changes in relative crop prices.

When allotments are imposed on one crop, surpluses to arise in other crops as farmers utilize non-allotment acres to produce those other crops. Thus allotments are often imposed on those additional crops.

Policy Tool: Payment in Kind (PIK).

Policy Area: Domestic Farm Policy, Supply Control.

What It Is: Payment in Kind is an acreage diversion program with the diversion payment in commodity rather than cash.

Objective: To reduce both production and stocks of grains in the farmer owned reserve and cotton in the CCC loan.

When Used: Payment in kind was used in the early 1960s for one year; in 1983 for wheat, cotton, corn, sorghum, and rice; and again in 1984 for wheat. The program has been used when government controlled stocks reach such unacceptably high levels that a PIK program is feasible.

Experience: PIK is one way to reduce stocks controlled by the government and to move these stocks out of government storage. The result is an overall reduction in stocks and increase in domestic prices. Problems occur when the government is required to pay out more PIK commodity than it owns, as was the case for cotton and rice in 1983. A decision that PIK commodities were not subject to the payment limit encouraged large volume producer participation. Question remains, however, regarding the legality of this decision.

Consequences: PIK provides an off-budget method for paying producers to divert cropland.

PIK increases domestic prices and food costs while reducing stocks.

PIK helps maintain market supplies while curtailing production which results in a price stabilizing effect.

Program effectiveness in increasing prices depends on farmer participation, slippage, and initial level of stocks.

PIK reduces the supply available for export.

Local communities, agribusiness firms, and livestock producers are adversely affected if signup is high.

Instead of adjusting excess resources out of crop production, PIK's artificially high prices may actually encourage them to stay.

STATEMENT OF DR. RAYMOND DANIEL, VICE PRESIDENT FOR AGRICULTURE, CHASE ECONOMETRICS, BALA CYNWYD, PA

INTRODUCTION

Recently, U.S. farm policies have, once again, come under considerable scrutiny and criticism. Much of the discontent over agricultural policy deals with its perceived direction and government cost. Farmers, consumers, and legislators have argued that recent voluntary acreage set-aside programs not only are too expensive, but do not solve the basic problems of continual surplus production and weak farm prices. It is estimated that over $21 billion were spent in 1983 through USDA's programs in an effort to reduce commodity surpluses. Yet there remains excessive inventories of feed grains and the potential for record production of feed grains again in 1985.

Discussions over a new 1985 Farm Bill have already begun. This dialogue over the future direction of agricultural programs is both healthy and beneficial, not only to the farm sector, but also to the consumer and legislative bodies since new four-year agricultural programs will be enacted in 1985.

The purpose of this testimony is to continue to enhance the current debate by addressing the major issues facing agriculture and thus challenging policymakers to continue to seek the correct mixture of agricultural programs. This choice would encompass programs that would enhance the marketing of U.S. agricultural products while still providing a protective net for U.S. farmers against major swings in the markets. This dramatic movement in prices is the cause of many bankruptcies in farms that, during more normal situations, are solid, viable production units.

CURRENT SITUATION

The volatility of both crop prices and, subsequently, farm income since 1977 has had severe repercussions throughout agriculture. Real farm income has returned to near-1930 depression levels and real gross farm income is 16% below 1974 levels, even though government payments have increased to over $20 billion. Farm real estate assets in current dollars have dropped 16% or more since 1980. This depressed economic environment has severely damaged the viability of the agricultural sector. Unless farm income can be stabilized at a much higher level and at a much lower cost to the government there will be increased farm bankruptcies, a general collapse in rural farm economies, and widespread dissatisfaction with agricultural programs. This is especially true in states where no alternative sources of income are readily available.

AGRICULTURAL POLICY ENVIRONMENT IN THE 1980S

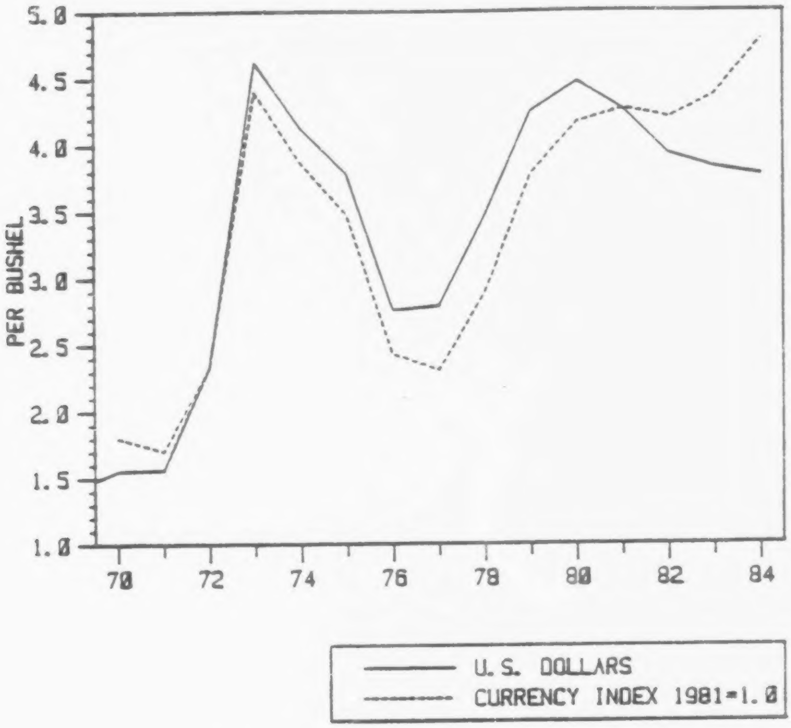
Farm programs in the 1980s need to become more compatible with the current realities of world grain trade. This is especially true in the grain sector which has been characterized by more periods of crop surpluses, low prices, and acreage reduction programs, than by periods of balanced supply and demand with no government intervention. The Chase Econometrics outlook for the decade ahead indicates that world economic recessions, balance of trade problems, the high value of the U.S. dollar, and high real interest rates will persist, thus slowing world grain trade to less than one-half the rate experienced in the 1970s. Therefore, grain surpluses are projected to continue and subsequent grain acreage withdrawal programs will need to remain in effect.

Future agricultural programs should also recognize that a "free market" for grains is no longer a reality due to grain embargos, long-term trade agreements by competitors, competing government import levies and restrictions, cargo preference requirements, and other noncompetitive market restrictions of governments throughout the world. U.S. farmers would welcome actual free markets where producers were not penalized by market restrictions, the high value of the dollar, and government intervention. However, this current noncompetitive structure of world grain trade requires that the next agricultural bill recognize the realities and assist U.S. farmers and agribusinesses in their struggle against institutions and barriers which foster constraints to trade, low commodity prices and, subsequently, low U.S. farm and agribusiness income.

In addition, the U.S. farmer has become non-price competitive in world markets because the record high value of the U.S. dollar adds $1.00/bu to the U.S. farm price of wheat, 72¢/bu to the price of corn, and $2.00/bu to the price of soybeans (Figures 1 and 2). Concurrently, present agricultural legislation is not necessarily equitable for all producers; by supporting market prices, current programs could reward farmers who continue to expand production while penalizing farmers who cooperate by participating in agricultural programs.

Figure 1

WHEAT PRICE: U.S. AND TRADE-WEIGHTED
(KANSAS CITY)



TRADE WEIGHTED VALUE OF THE DOLLAR: WHEAT

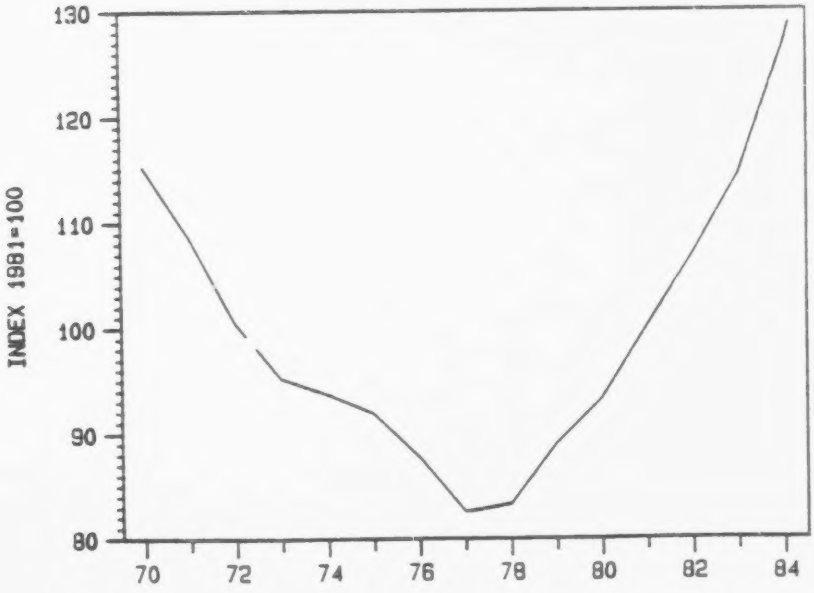
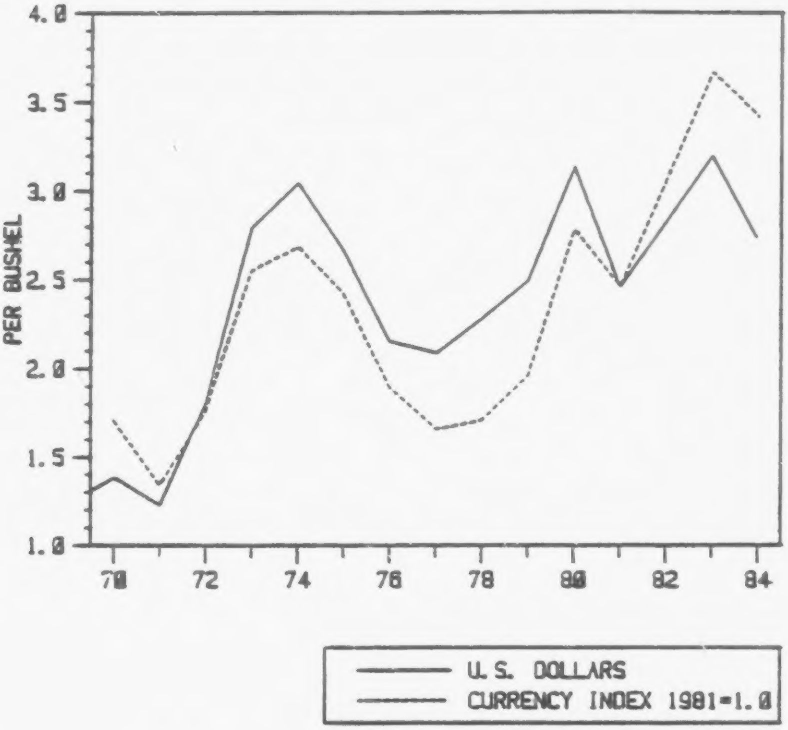
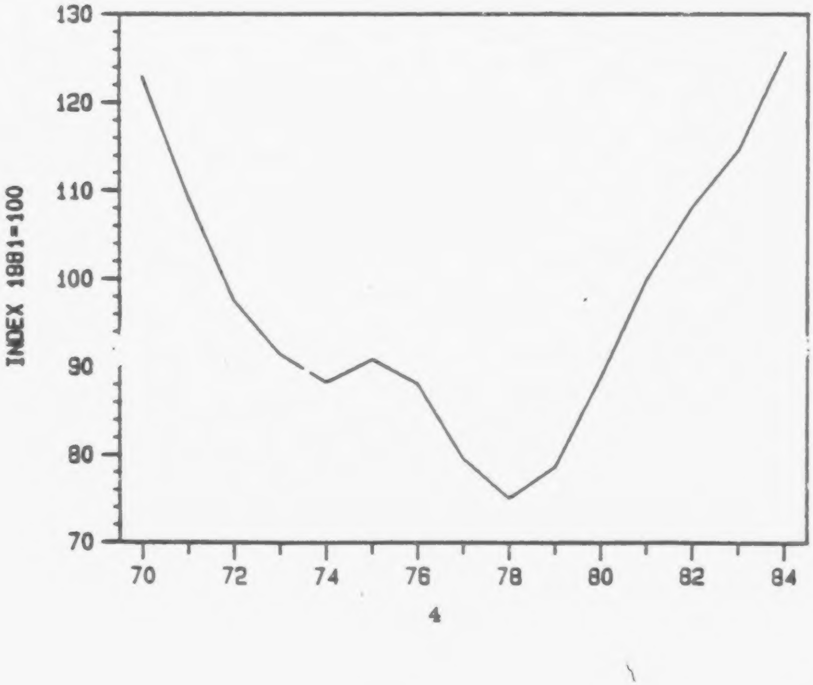


Figure 2

CORN PRICE: U.S. AND TRADE-WEIGHTED
(OMAHA)



TRADE WEIGHTED VALUE OF THE DOLLAR: CORN



All of the above factors must be dealt with in the development of farm policy. The bottom line is that every effort should be made to stimulate new programs which stabilize farm income at more equitable levels.

FARM PRODUCT DEMAND STIMULATION PROGRAMS

Farmers and economists strongly support efforts to stimulate stable growth in the demand for U.S. farm products. Efforts both here and abroad that enhance the movement of U.S. farm products at prices which provide for potential growth in U.S. agriculture should be aggressively pursued.

The United States must become more aggressive and innovative in marketing U.S. farm products. The concept of free markets as the solution to farm surpluses is one which has always had great appeal, however, real world trade in agricultural commodities is clouded by protectionist policies, fiscal policies, other government constraints, and the high value of the U.S. dollar.

For example, U.S.S.R., Canada, and other countries have made several long-term trade agreements, the European Community subsidizes exports, and many countries utilize government agencies to purchase and/or sell agricultural products, thus reducing the functioning of a free market system. Currently, as much as 95%, or more, of all grains are either bought or sold through government agencies.

Specific types of U.S. government policies which could be undertaken to enhance agricultural exports are:

Increase the use of export credits, particularly to countries where U.S. market share has been eroded due to competitors who subsidize exports or employ other non-free market incentives.

Market development programs that are currently underway through such agencies as U.S. Wheat Associates, Inc., the American Soybean Association, the U.S. Feed Grains Council, and the Foreign Agricultural Service (FAS) should be funded at much higher levels. The U.S. spends less than one percent of the value of U.S. agricultural exports in market development research, considerably lower than any major agri-exporting country. Current estimates indicate that every dollar spent on export market enhancement programs returns at least $48 in the soybean sector and $35 in the wheat sector.

The PL 480 program should be reevaluated and streamlined. Current requirements, approval procedures, and other red tape make it almost impossible to effectively meet the needs of many low income countries. Also, cargo preference requirements that U.S. flag ships carry 50% of PL 480 grain should be eliminated.

The sanctity of U.S. grain export contracts should be guaranteed in order to enhance our image as a reliable supplier to all nations. Embargoes and other restrictive trade policies hurt long-run prospects for U.S. grain trade and foster competition from non-U.S. sources. For example, the 1973 embargo of soybeans to Japan stimulated the development of the Brazilian soybean industry. Similarly, the 1980 Russian grain embargo and the subsequent de facto embargo after 1980 encouraged expanded grain production in Argentina and other grain producing countries. Yet another example of trade policy which had a negative effect was the 1983 politically imposed US/PRC textile dispute.

However, even if such programs are successful in stimulating demand, the United States has the supply capability to exceed both domestic and export requirements for at least the next decade. Wheat exports, for example, exploded by 190% in the 1971–81 period and yet acreage restriction and storage programs have been required since 1977 to control surplus supplies.

GOALS AND OBJECTIVES OF U.S. AGRICULTURAL POLICY

Farm programs should be developed to address the new world agricultural environment more effectively. The specific goals and objectives of new agricultural programs should be the following:

1. To improve farm income.
2. To expand and enhance U.S. grain trade through joint efforts of farmers, government agencies, agribusinesses, input suppliers, and the grain merchants.
3. To balance U.S. wheat and grain production with domestic and world demand, thus reducing U.S. grain surpluses.
4. To maintain U.S. grain prices at levels which equalize the effect of government subsidies paid to farmers in each competing country.
5. When U.S. supply management programs are necessary, they should be equitable to all U.S. grain farmers and based in more recent production levels.
6. Production management programs, when needed, should include more effective control over production, not just acreage.

7. Participation in production management programs should be more oriented toward long-term stability and less toward short-term adjustments which create instability in grain markets.

8. The grain programs should provide income security to farmers during times of unexpected increases in grain inventories which depress prices.

9. The cost of the programs should be borne more by the sectors receiving the largest program benefits (i.e., grain producers, agribusinesses and consumers). Government program costs should be minimized.

10. Adequate grain reserves should be maintained to protect domestic and export customers against droughts and other crop failures.

11. Government policy should also be sensitive to the impact of programs on the future structure of agribusinesses, farmers, and rural communities. Program changes do significantly impact ownership, size, and regional growth.

12. Management programs should also be oriented toward conserving U.S. farm land by preventing soil erosion and depletion of other nonrenewable resources.

IMPACT OF U.S. FARM PRICES ON AGRICULTURAL EXPORTS

The most important single market parameter governing the benefits of different farm programs to farmers is the price elasticity of demand for exports. The magnitude of the elasticity of demand varies considerably from situation to situation and its value is subject to much misinterpretation. Nonetheless, sufficient concensus is now emerging about the range of elasticity estimates.

The fundamental cornerstone of U.S. farm policy has been based upon the assumption that the aggregate demand for U.S. farm products is inelastic. Recent research continues to support the contention that the short-term (1 to 2 years) and intermediate term (2 to 4 years) is inelastic for major U.S. grains. The longer run (5+ years) appears to be elastic.

Therefore, any decline in crop prices will reduce farm total revenues for at least four years before the price decline is offset by higher volume exports. The current financial crisis in agriculture does not give U.S. farmers the flexibility to sustain a four-year decline in total revenues.

PRICE SUPPORT AND SUPPLY CONTROL

As previously stated, every effort should be made to implement policies to stimulate demand, however, the primary focus of the 1985 Farm Bill, which is price support and supply control programs cannot be abandoned. Even if demand can be successfully stimulated, the U.S. supply capability is expected to exceed both domestic and export requirements for the remainder of the decade. Consequently, without price support and supply control programs, agriculture will continue to face the probability of excess crop supplies, volatile prices and less than desirable income levels.

Recognizing the importance of price support and supply control programs to maintain a viable farm sector, the following observations include suggested modifications and changes in existing programs.

Supply control programs should be structured so they will encourage long-term participation. Allowing growers to participate in an "on again-off again" manner invites market price volatility and creates considerable uncertainty among both growers and agribusinesses.

The least productive and easily erodable land should be removed from production.

The benefits, to all citizens, in terms of soil conservation should be considered when determining the rewards to be given for long-term participation or extended acreage diversion.

The price support and supply control policies have come under considerable criticism in the last two years. Most of this criticism has, with good reason, been directed toward the level of government support for agriculture. In the last few years, the cost of government programs has risen dramatically, reaching an estimated $21 billion in 1983. Most critics point out that while government support has increased, it has not solved the problems of overproduction, low farm income, or large commodity surpluses. Wheat inventories are still running at record levels and had it not been for the 1983 drought, feed grain inventories, even with PIK, would be double what most consider a desirable level.

Part of the ineffectiveness of government programs over the last few years can be blamed on "bad luck." During the five-year period from 1978 through 1984, the U.S. set record yields—five times for corn, and five times for wheat.

The "bad luck" did not turn around in 1983 when the Secretary of Agriculture implemented the most massive government program in history. What happened?

Wheat yields set another record which resulted in virtually no drawdown in surplus inventories and feed grain yields plunged to their lowest levels in ten years. While weather has obviously played a role in the problems that have faced agriculture in the last few years, part of the problem can also be directed toward the commodity programs. Also, the major benefit of the PIK program, i.e., high prices, was offset in 1984 by fence row to fence row production.

In general, government efforts in agriculture should be directed more toward demand stimulation rather than toward supply control. However, policymakers should be cognizant of the fact that even with successful demand stimulation policies, demand is unlikely to catch up with U.S. supply capabilities during this decade. Until there is a better balance between the supply and the demand for U.S. grain, demand stimulation policies alone will not be enough to solve the problems of the agricultural sector. Consequently, supply control and support programs will continue to be necessary to maintain a viable agricultural economy. These programs need to be structured in a manner which will supply the agricultural industry with a "safety net" without encouraging overproduction.

AN EFFECTIVE U.S. SUPPLY MANAGEMENT AND PRICE SUPPORT PROGRAM

The predominance of major economic food demand studies indicate that the demand for food grains, such as wheat, is inelastic in the intermediate run (1 to 4 years). Our own studies confirm that, on average, a 1% decrease in wheat prices has only a 0.5% to 0.8% positive impact on U.S. wheat exports, thus, a decline in wheat prices reduces total revenue to U.S. wheat farmers. In other words, lower market prices mean lower farm income. Farm programs are therefore based on the premise that a supply management program, which balances production with changes in world demand by reducing supplies, will increase total revenue to U.S. agriculture and subsequently improve the overall economic vitality of U.S. producers, agribusinesses and rural America.

The following are characteristics of an effective and balanced supply management program.

1. A long-term U.S. supply management program would be based on estimates of domestic and export needs at prices which would provide for a viable U.S. farm economy.
2. The proposed supply management program would utilize USDA farmer cost of production data to develop loan and target price support levels which would provide an economic safety net protecting farmers against unexpected collapses in world grain markets.
3. The maintenance of a "true" U.S. grain emergency reserve would be an essential part of the program, thus protecting U.S. consumers against potential crop shortfalls.
4. The USDA would also provide policy mechanisms which would insure that the supply management program had the capacity to control production at levels which would minimize government program costs.
5. The USDA would eliminate restrictions against long-term trade agreements and provide the necessary finances to allow the development of marketing techniques which would allow U.S. farmers to compete in current "non-free trade" world markets.
6. The USDA would also provide incentives to enhance conservation of the United States most scarce resource (i.e. land) by stimulating the removal of land that cannot stand intensive use due to severe erosion.
7. A non-participant farmer advisory board would advise the USDA on the direction of this new farm supply management marketing program.

AN EFFECTIVE LONG-TERM PRODUCTION CONTROL PROGRAM

Current farm programs are very short-run attempts at correcting depressed market prices by encouraging farmers to voluntarily commit to one-year acreage set-aside programs. The Secretary of Agriculture stated that, "The present program for readjusting productive acreage to market requirements is admittedly but a temporary method of dealing with an emergency. It could not be relied upon as a permanent means of keeping farm production in line with market requirements." The Secretary of Agriculture was Henry A. Wallace, the year was one year after the current Agricultural Adjustment Act was first enacted in 1933. Fifty years later we still have the same "temporary" voluntary acreage set-aside programs.

Recent government programs not only have been very short-run oriented, but their implementation has also been on a very ad hoc basis. The details of farmer acreage control programs have not even been announced until after winter wheat farmers have already planted their crops. Farmers, therefore, do not know how to plan their cropping program or what to expect from government assistance programs.

Current farm programs also are oriented toward what happened last year and/or to correcting current grain excess inventories or low prices. In addition, when voluntary acreage set-aside programs are effective in improving prices in one year, farmers abandon the program the second year because of the high capital costs in agriculture and the lack of a long-term commitment by the government to maintaining a stable program. The subsequent resurgence in production again creates surpluses and weak farm prices. Such instability has caused a major expansion in farm debts and hurt the entire farm community.

An effective farm supply adjustment program therefore requires a multi-year commitment from farmers. A long-term supply management program could be implemented in the following manner:

1. The USDA would estimate world and domestic grain needs for the next marketing year. These estimates would be used to determine U.S. production.
2. Importing countries would be encouraged to make multi-year trade agreements with the United States to assist in establishing U.S. production levels.
3. A supply management program would be announced in June, prior to the planting of the winter wheat crop, specifying the details of the program.
4. Grain inventory levels would be established which would maintain farm prices at or near the established target prices.

Ever since grain supply control programs were established in the 1930s, the USDA has used voluntary acreage set-aside or control programs. This approach however has not been very successful in adjusting supplies to changing market conditions. Base acreages have been greatly increased and participation rates have been very unsatisfactory without major government expenditures. Farmers sometimes did not even have adequate information on the economic consequences of participation in such voluntary programs. In some years, farmers who did not participate in acreage set-aside programs received more financial rewards than those who did participate, since farmers who participated did not have as much to sell when prices improved after the government program reduced supplies. Farmers are thus less willing to participate in future programs and subsequently force government program costs even higher to induce future participation.

Even when farmers have participated in voluntary acreage control programs, the desired reductions in production have not been achieved. For example, acreage control programs in 1983 would have reduced production by 600 million bushels, assuming normal yields. However, excellent weather boosted wheat yields four bushels per acre above normal, thus the acreage control program reduced production by only 387 million bushels.

Long-term land retirement programs that require multiple-year voluntary commitments and which remove cropland from production of farm commodities can be very expensive, and may require increases in government expenditures. This type of program was authorized in the Agricultural Act of 1956 as the Soil Bank Program. The advantage was that land would be put into the soil conservation program until needed. However, because of the regional concentration of enrollment in the program, the result was the demise of numerous rural communities. Also, publicity concerning the payment of U.S. funds to many farmers for not producing crops on questionable land was very intense.

Therefore, only a long-term mandatory supply management program would:

1. Minimize government costs,
2. Reduce the concern about eliminating certain rural communities,
3. Eliminate the stigma of directly paying farmers not to produce, and
4. Control supplies, thus improving farm prices and revenues.

APPENDIX A—THE IMPACT OF U.S. WHEAT PRICES ON U.S. WHEAT EXPORTS—U.S. WHEAT EXPORT PRICE ELASTICITY—NEBRASKA WHEAT GROWERS' POLICY SEMINAR

Hilton Hotel, Lincoln, NE, October 10, 1984

SYNOPSIS

One of the major objectives of the Nebraska Wheat Growers seminar on U.S. Wheat Exports and farm policy was to develop a better understanding of the impact of U.S. wheat prices on U.S. wheat exports. The fundamental cornerstone of supply control farm policies rests upon the question of whether the demand for wheat and other commodities is elastic or inelastic. Dr. Tweeten stated it correctly in his opening remarks when he indicated that the price elasticity of demand for exports was perhaps the most important single market barometer governing the wheat economy.

The conference began with a detailed discussion of the importance of and meaning of price elasticities. Dr. A.L. Fredrick of the University of Nebraska opened the conference and indicated that if a product such as wheat has an inelastic demand (less than −1) then the percent change in quantity purchased by the buyer will be less than the percent change in price. If such is the case then producers can increase their total revenue by increasing prices. However, if the demand for wheat is elastic (greater than −1) then farmers can improve their total revenue by reducing prices since the percent change in quantity is greater than the percent change in price.

Dr. A.L. Fredrick reviewed several articles dealing with the elasticity of domestic and export demand for wheat, and concluded that previous research studies had developed both inelastic and elastic demand estimates for wheat. The reasons for differences in previous research estimates were: period when research was undertaken, method of estimation, range in prices over which the estimates were made, and whether the analysis estimated short-run or long-run price elasticities. He concluded that more research needed to be done.

Dr. W.H. Meyers of Iowa State University also indicated that several major factors other than price impacted U.S. wheat exports. Dr. Meyers illustrated how the value of the U.S. dollar has escalated since 1979, thus increasing the price of U.S. wheat to our customers. He also indicated that interest rates, world economic recessions, foreign debt, and other non-price factors have a significant impact on U.S. wheat exports. Dr. Meyers shared research that he had undertaken at Iowa State on the impact of U.S. wheat prices on U.S. wheat exports. His research indicated that in the short-run (one to two years), the elasticity for wheat is inelastic (less than −1), and that during the last two to three years, wheat export markets have become even more inelastic with respect to wheat prices. Their latest estimates of short-run price elasticities were less than −0.2 meaning that a 10 percent increase in U.S. wheat prices would reduce U.S. wheat exports by less than 2 percent. Dr. Meyers also suggested that farmers should become more aware of the impact of major economic forces outside of agriculture, such as the value of the dollar and other government policies, on the U.S. wheat economy.

Dr. Robert L. Sargent of Washington State University, indicated that the wheat economy of the Pacific Northwest was uniquely different from the rest of the country. They produce White Wheat which is almost all exported to Asian Rim markets. He indicated that the strong U.S. dollar, world-wide recession, high interest rates, protectionist activities, cargo preference, and embargos all significally impact their ability to export White Wheat. He also indicated that farm programs, which regard wheat as wheat, regardless of sharp differences in end uses and competitive situations is not very logical. He emphasized that wheat farmers should be more market oriented in their attempt to improve the outlook for wheat.

Dr. Luther Tweeten of Oklahoma State University began his remarks by discussing the structural changes which have occurred in the international wheat market during the past two decades. The volume of world trade has increased rapidly, and now a relatively large portion of world production enters international markets. The U.S., however, still remains the largest wheat exporter.

Dr. Tweeten said it is clearly "apparent that the elasticity of wheat demand has a strong influence on whether wheat producers are better or worse off from a policy to influence the wheat market price". He emphasized that it is key to any evaluation of supply restriction programs to understand the different types of wheat price elasticities. In fact, Dr. Tweeten presented a detailed evaluation of previous estimations of different price elasticities, and concluded that the key to utilizing price elasticities was to understand the difference between short-term, intermediate-term, and long-term price elasticities. His definition of the short-term was one to two years, the intermediate-term was three to four years, and the long-run term was perhaps beyond four years. He emphasized that long-term elasticities are important in evaluating long-term policy programs.

Dr. Tweeten also indicated that one of the major factors impacting the elasticity of U.S. wheat export demand is trade policies of importing and exporting countries which insulate their domestic price from world prices. The European Community was cited as an example of a major importing and exporting region which has variable levies against grain imports, and at the same time subsidizes wheat exports. Japan's food agency was also used as an example of a state trade monopoly, restricting the impact of world wheat prices on their domestic markets.

Dr. Tweeten provided a review of previous research dealing with long-run price elasticities (four years or more before the full impact of price changes are fully realized). He concluded that it is impossible to provide a solid point estimate of the long-run export price elasticities of demand for U.S. wheat. He, however, felt the evidence indicates that the short-term price export elasticity for wheat (one to two years for the full impact of a price change to be fully realized) was in the range of −0.2 to −0.6, while the intermediate-term (three to four years for the full impact of a price change to occur) was −0.6 to −0.9, and the long-term (four years or more for the full impact of a price change to occur) was perhaps −2.0 to −2.8. Combined with an appropriately weighted domestic long-term demand elasticity of −0.2, the resulting total long-term elasticity of U.S. wheat demand is, then, −1.55.

Therefore, lower quantities of wheat marketed would raise wheat prices in all lengths of run, improve receipts at least in the short-term and intermediate-run (one to four years), but total receipts would be reduced in the long-term (after four years).

Dr. Tweeten also discussed the potential gains which could be received from establishing a world grain export cartel. He indicated that if the U.S. joined other major wheat exporters (Canada, Australia, Argentina, and the EC-10) they would control 93 percent of total world trade, and if world wheat exports were inelastic, then this cartel could benefit by restricting quantity and raising wheat prices. However, he indicated that long-run gains from such a cartel were questionable. Non-cartel members could eventually increase production, reducing the cartel's market share. Discipline of members within the cartel could also be difficult to maintain.

Dr. Tweeten concluded his remarks by indicating that the results of his work indicated potential long-run revenue gains for farmers might be realized from a two-price system, charging a higher price in the U.S. domestic market, which is inelastic, and a lower price in the more elastic wheat export market. He also indicated that the U.S. needs to make sure that U.S. wheat is priced competitively on world markets to maintain export quantity and revenue.

Dr. Ray Daniel of Chase Econometrics presented his research which estimated the impact of U.S. wheat prices on U.S. wheat exports. In his opening remarks, he indicated that U.S. current-dollar wheat prices have remained relatively flat since 1979. Real dollar wheat prices (current prices adjusted for inflation) have collapsed, reaching pre-1972 levels. This collapse has dropped wheat prices below farmers cost of production, and has created a major financial crisis in the wheat sector. His analysis agreed in principle with the previous discussions of wheat price elasticities. His research indicated that export price elasticities varied with the level of real prices, country purchasing wheat, and noneconomic factors such as embargoes and trade restrictions. Dr. Daniel emphasized that his research indicated that world grain production, government import restraints, embargoes, and the value of the U.S. dollar had more impact upon U.S. wheat exports than did U.S. wheat prices. The research undertaken by Chase Econometrics indicated that wheat export price elasticities varied with respect to the level of real wheat prices and importing regions of the world. For example, when real wheat prices are at $2.50 (1972$) or more (i.e., the norm between 1973 and 1975), the short-term wheat export price elasticity was very elastic. However, since 1981, real wheat prices have dropped below $1.80/bushel (1972$) and the short-term price elasticity has become very inelastic (−.2 to −.3). This would indicate that current dollar U.S. wheat prices could be increased to $4.20 to $4.50 at the farm level before reaching real dollar price levels of $2.50 (1972$), where export demand for U.S. wheat becomes elastic.

His analysis also indicated that the current short-run elasticity for wheat was very inelastic (less than −0.3) in most regions of the world, except for the Soviet Union (−0.56). The Soviet Union appears to be more sensitive to wheat prices, since they are more willing to substitute feed grain purchases for wheat, when wheat prices are high.

Dr. Daniel indicated that the discussion during the seminar centered on the demand for wheat and the impact of wheat prices on U.S. wheat exports. The analysis presented by each speaker indicated that the impact upon total revenues would be determined by whether the demand for wheat was elastic or inelastic. Dr. Daniels's analysis supported the conclusion of other speakers that the short-run and intermediate-run price elasticities are inelastic: this means that price increases which are less than four years in duration actually increase total revenues to farmers.

He also indicated that price increases of more than four years in duration, which are faster than world wheat cost of production, could indeed reduce U.S. exports and total wheat revenue. However, Dr. Daniel pointed out that both supply and demand must be considered in determining U.S. wheat exports and prices. The supply of wheat which should be offered by any producer and/or businessman is determined by his profits, not total revenue. If prices are so low that producers cannot cover their short-term, intermediate-term, or long-term costs of production, then they must reduce production or eventually go bankrupt. Current wheat prices were shown to be below farmer's long-term cost of production, which includes a return to fixed resources.

Current wheat surplus inventories are depressing prices and subsequently bankruptcy has become more common, thus, the current structure of U.S. agriculture is in question. Large absentee owners of wheat farms could dominate the industry. Dr. Daniel also pointed out that if we attempt to reduce the current 1.47 billion bushel wheat inventory in one year, to below 1 billion bushels, we would have to drop the U.S. farm wheat price below $1.00/bushel, assuming the short-run elasticity estimates presented (i.e., domestic elasticity of (−.2) and export elasticity of (−.3)). The U.S. farm wheat price would have to be reduced to $1.66/bushel for two to three years before the current inventory of 1.4 bushels could be reduced to 800 million bushels, assuming an intermediate price elasticity of −0.8 of wheat exports and −0.2 for domestic use and assuming production remains between 2.3 and 2.5 billion bushels. Assuming the long-run domestic price elasticity is −0.2 and the export price elasticity is elastic at −2.6, then U.S. farm wheat prices would have to be lowered to at least $2.70/bu and remain at that level for over four years to reduce the current glut to under 800 million bushels, again, assuming no change in production below 2.3 billion bushels during that period. Therefore, the inelastic nature of U.S. wheat export demand in the short and intermediate run implies that something other than a reduction in prices to stimulate demand is necessary in order to eliminate the current glut in the wheat sector within the next two to three years. U.S. production also would have to be reduced by the lower prices forcing U.S. farmers out of wheat production and into possible, bankruptcy, the development of a major government export subsidy; program, or the initiation of a strong supply management program.[1]

Dr. Daniel concluded that the relative insensitivity of U.S. exports to U.S. wheat prices implies that a supply management program that in the short- and intermediate-run (i.e., one to four years) could increase U.S. wheat farm prices could be increased and total wheat revenues would increase. For example, the U.S. wheat farm price to $4.00 to $4.50/bushel in 1985 before reaching the elastic segment of the demand curve. Price increases could then be maintained close to world inflation for two to four years without having a significantly negative impact on total revenues. He also agreed that price increases ($6.00/bushel for more than four years) would meet significant market resistance, subsequently, reducing U.S. exports by stimulating production aboard, and thus reducing total revenues to U.S wheat farmers.

It was also evident from Dr. Daniel's discussion that farm programs, which attempt to improve farm income by only reducing U.S. wheat prices, are counter productive for the first three to four years, and that it would take U.S. farm wheat prices below $1.75/bushel or less to reduce the current wheat surplus below 800 million bushels by 1986, assuming no other farm program, and wheat production above 2.3 billion bushels.

STATEMENT OF DR. LUTHER TWEETEN, REGENTS PROFESSOR, DEPARTMENT OF AGRICULTURAL ECONOMICS, OKLAHOMA STATE UNIVERSITY, STILLWATER, OK

Ideally, a farm bill addresses both short-run and long-run problems and needs for a food and agricultural policy. Before addressing specific direction for farm policy legislation in 1985, I review problems and needs of agriculture as well as selected principles to guide policy.

IMMEDIATE CONCERNS

The two principal immediate concerns of agriculture are financial stress and excess capacity.

Financial stress

In a recent paper entitled "Farm Financial Stress, Structure of Agriculture and Public Policy" (presented to the American Enterprise Institute conference on U.S. Agricultural Policies), I examined incidence, causes and cures for financial stress now plaguing the farming economy. Notable conclusions were:

(1) Financial stress is severe for approximately one-fourth of all farms and over one-half of all farm debt.

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[1] USDA estimated cash expenses for wheat production in 1983 at $2.38/bu and cash expenses plus replacement costs at $3.00/by (USDA,"Farmline," October 1984, pp. 9).

(2) Financial stress is not caused by low product prices, by low receipts, by low land earnings, or by reckless overbidding for land. The principal proximate cause is high real interest rates. High real interest rates increase farm interest expenses and hence reduce farm net income. High real interest rates, by reducing land prices and net worth, also reduce collateral to obtain debt capital.

(3) Financial stress is most severe among mid-size family farms. Compared to mid-size farms, large farms fare better because of favorable asset earnings while small farms fare better because of off-farm earnings.

Excess capacity

Farm prices would be lower in the absence of government programs removing excess production capacity. I estimate that overall farm output would exceed market utilization by 5 percent with normal weather. Release of such output on the market would depress overall farm prices about 20 percent and receipts 15 percent in the short run. Prices and receipts would fall even more for some commodities. For example, excess capacity is approximately 10 percent in grains. Excess capacity stems from a drop in exports caused by the high value of the dollar, financial crises in foreign countries and slow economic growth abroad.

Appropriate Federal response

Financial stress and excess capacity trace mainly to the same source—uncontrolled federal structural (full-employment) deficits. After time for adjustment, a more balanced budget would reduce real interest rates and the exchange value of the dollar and increase exports to relieve much of the financial stress and excess production capacity in farming.

The first best solution to problems of financial stress and excess capacity is for government to demonstrate control over the federal budget by enacting legislation to reduce the deficit by $50 billion per year over the next four years.

The second best solution is targeted credit assistance—a program now in place although very limited in scope.

The third best or least satisfactory solution is more generous commodity programs. One billion dollars will go much farther to relieve current farm problems if carefully targeted to farmers with financial stress than if spread over large numbers of farmers through commodity programs. Given the importance of restraining the federal budget, an increase in commodity program benefits to relieve financial stress seems out of the question. But curtailing commodity programs at the rate called for in the Administration's proposal would turn financial stress into a debacle of unprecedented dimensions. Some income protection is needed by farmers until real interest and exchange rates decline.

LONG-TERM CONCERNS

Long-term problems of agriculture include instability from weather and other sources, poverty, environmental degradation such as soil erosion, and family farm demise. Commodity programs are suited to address some but not each of these longer-term problems.

Consumers want adequate quantity quality, safety and stability in food at reasonable prices. Agribusiness firms want a predictable policy environment so they can plan ahead with some assurances that policy interventions will not leave them with large shortages or surpluses of what they supply.

The setting for legislation today is very different than in 1933 when the first major commodity programs originated. Several principles describing the economic environment for commodity programs need to be noted in formulating legislation:

(1) Farm programs have departed sharply from past directions only in times of crisis such as the Great Depression and World War II. Some would contend that the current federal deficit constitutes a crisis deserving of major new directions to cut spending. But another offsetting crisis also looms large—the farm debt crisis. As noted earlier, abandoning of commodity programs "overnight" would impose intolerable economic hardship on already financially stressed farmers.

(2) Voluntary supply control programs have lost their capacity to restrain output at reasonable cost to taxpayers. Slippage is so great that voluntary acreage diversion programs are little more effective than direct payments in raising farm income per Treasury dollar spent. Wheat is an example of a commodity program that has encouraged output. The wheat allotment base increased from 53 million acres in 1975 to 93 million acres in 1984! Farmers have never planted 93 million acres of wheat and would plant much less if government programs were terminated. A lesson is that market price incentives are needed to help government diversion programs restrain output and expand utilization.

(3) Given the paramount importance of cutting Treasury cost, two broad approaches are possible with commodity programs. One is mandatory controls; the other is a greater market orientation. As noted in Table 1, mandatory controls to raise prices to cover (a) resource costs of production or (b) 100 percent of 1910–14 price parity would require substantial production cutbacks because major markets, particularly export outlets, would be lost. Producers would find expansion largely confined to a domestic market which grow much slower than productivity. Hence, allotments (if on acres) and receipts of many commodities would grow ever smaller. Demand is sufficiently elastic for some farm commodities that receipts would fall with high rigid price supports and mandatory controls.

Table 1. Estimated consumption, yield and acres with prices supported to cover economic cost of production or 100 percent of 1910-14 parity for major crops, with comparisons for actual 1980-83.

	Cost of Production (1981-83)[a]	100% 1910-14 Parity (Jan. 1985)	Consumption			Yield/Harv. Acres			Harvested Acres			Elasticities of Demand[b]	
			Short run	Long run	1980-1983	Short run	Long run	1980-1983	Short run	Long run	1980-1983	Short run	Long run
Feed grains	$3.02/bu.	(corn)	216	212	219	2.25	2.26	2.31	96.0	93.8	101.5	-.287	-.718
	(corn)	$5.14/bu.	186	145	(MMT)*	2.35	2.54	(MT/A)*	79.2	57.1	(MA)*		
Wheat	$4.35/bu.		2,325	2,077	2,469	36.4	37.6	35.7	63.9	55.2	69.2	-.347	-1.002
		$7.07/bu.	1,965	1,276	(MBu)*	38.2	43.5	(Bu/A)*	51.4	29.3	(MA)*		
Soybeans	$6.77/bu.		1,975	1,996	1,961	28.3	28.2	28.4	69.8	70.8	66.3	-.475	-1.220
		$12.80/bu.	1,459	918	(MBu)*	31.0	36.7	(Bu/A)*	47.1	25.0	(MA)*		
Cotton	$.79/lb.		10,849	9,558	11,664	1.08	1.13	1.06	10,045	8,458	10,980	-.320	-.880
(Upland)		$1.24/lb.	9,392	6,428	(1,000 bales)	1.13	1.27	(Bale/ Acre)	8,312	5,061	(1,000 acres)		

*MMT - Million Metric Tons
*MT/A - Million Tons/Acre
*MA - Million Acres
*MBu - Million Bushels
*Bu/A - Bushels/Acre
*Bale/A - Bale/Acre (480 lb. bale)

[a] Date from Economic Research Service, U.S. Department of Agriculture (ECIFS 3-1, July 1984). Cost/cwt. for milk average $13.85. A management charge equal to 5 percent of receipts is included.

[b] For sources of elasticities, see article by Tweeten in American Journal of Agricultural Economics (65:922-31, December 1983).

(4) Commodity programs supporting prices above market clearing levels raise farm income in the short run but not in the long run. Programs lose their effectiveness because higher prices generate additional output and less utilization and because benefits are bid into rents and land prices. Thus benefits are lost to renters and new landowners.

(5) Farm economic problems are heavily concentrated among mid-size family farms. The incidence of serious financial stress is as high as 50 percent in some classes of moderate-size farms. The incidence of stress is lower on larger farms because they have high returns on assets and is lower on most small farms because they have substantial off-farm income. Past commodity programs have not preserved the family farm. If they are to preserve family farms, a greater share of benefits will need to be targeted to mid-size farms. That implies greater reliance on direct payments rather than price supports and supply management. Payment limitations can keep down Treasury costs. Targeted payments can also recognize that it is difficult indeed to justify transfers to farmers with sales of $200,000 or more who on average have far higher income and wealth than the average taxpayer but who account for half of all farm output.

(6) World markets are sensitive to price. If the U.S. desires to retain world markets, it will need to price its products competitively. Not all farmers wish to sell in world markets at prices required to compete. There is merit in not using public policy to artificially or arbitrarily raise or lower our export prices for world markets. The preferred strategy instead is to allow markets to set prices, letting each farmer decide whether or not he/she wishes to supply output at the resulting competitive prices. Even if export demand is elastic so that a greater export quantity and lower price raise receipts, it is best to leave the decision of whether to raise or lower price to the market.

(7) A final but highly important principle is that the farm economic vitality cannot be restored by commodity programs alone. For example, U.S. wheat is not now competitive in world markets although in real terms the wheat target price is lower today than was the loan rate in 1960, and both the loan rate and target price are lower than in 1980 (Table 2). Among major commodities in Table 2, only dairy price supports were higher in real terms in 1984 than in 1960. However, dairy price supports were substantially lower in 1984 than in 1980.

TABLE 2.—NOMINAL AND REAL SUPPORT LEVELS FOR SELECTED COMMODITIES AND YEARS, 1960–84

Commodity, support, and unit	Year			
	1960	1970	1980	1984
DOLLARS PER BUSHEL				
Corn:				
Loan:				
Nominal	1.20	1.05	2.25	2.55
Real 1984	3.68	2.50	2.77	2.55
Target:				
Nominal		1.35	2.35	3.03
Real 1984		3.22	2.89	3.03
Wheat:				
Loan:				
Nominal	1.78	1.25	3.00	3.30
Real 1984	5.46	2.98	3.69	3.30
Target:				
Nominal			3.63	4.38
Real 1984			4.47	4.38
Soybeans:				
Loan:				
Nominal	1.85	2.55	5.02	5.02
Real 1984	5.67	5.36	6.18	5.02
CENTS PER POUND				
Cotton (upland):				
Loan:				
Nominal	32.42	20.24	48.00	55.00

TABLE 2.—NOMINAL AND REAL SUPPORT LEVELS FOR SELECTED COMMODITIES AND YEARS, 1960–84—Continued

Commodity, support, and unit	Year			
	1960	1970	1980	1984
Real 1984	99.38	48.25	59.10	55.00
Target:				
Nominal			58.40	81.00
Real 1984			71.91	81.00
DOLLARS PER HUNDREDWEIGHT				
Dairy (milk):				
Loan:				
Nominal	3.06	4.66	13.10	12.60
Real 1984	9.38	11.10	16.13	12.60

[1] Deflated by Personal Consumption Expenditure price index, 1984 = 100.

Source: U.S. Department of Agriculture.

Price supports for 1984 shown in Table 2 can be compared with costs of production for 1981-83 in Table 1. Target prices for corn, wheat and cotton in 1984 were remarkably close to full resource costs of production for the respective commodities in 1981-83. Given that many farmers produce at less than the average resource cost of production shown in Table 1 and that the target price has become the supply price for much output, it would be unwise to increase target prices.

Real support prices, except for the cotton target price, have fallen since 1980 for all commodities shown in Table 2. Due to approximately a 50 percent rise in the real value of the dollar in international exchange, the U.S. has become much less competitive in world markets. To the U.S. corn farmer, real loan rates fell 8 percent from 1980 to 1984. But to the average corn customer abroad, real corn loan rates rose approximately 50 – 7 = 43 percent. Loan rates need greater flexibility than they have had in the past to respond to competitive world conditions. However, farm loan rates and farm prices cannot alone compensate for a 50 percent rise in the value of the dollar. The conclusion is that adjustment trauma to agriculture and the burden on commodity programs to stabilize economic outcomes can be minimized if sound macroeconomic practices are followed that do not distort real interest rates or exchange rates.

PROSPECTIVE FEATURES FOR 1985 FARM LEGISLATION

The Administration's recently released proposal for commodity programs contains several desirable features including a long-term market orientation and an extended (15 year) life. But the proposal calls for more rapid transition away from price supports than could be borne by farmers without massive trauma given the existing excess capacity and financial stress. Also, at the other extreme, proposals by various farm groups for high rigid price supports and mandatory controls for major commodities are anachronisms in today's internationalized agriculture. A middle ground between these extremes has merit.

An appropriate policy response, given the conditions and principles stated above, is to modify existing programs. Some suggestions are offered below.

Support rates

The single most useful provision of the Administration's proposal is to establish loan rates according to a three-year moving average of past market prices. The drop to 75 percent of the moving average in 1986 will come too quickly, however. I suggest for grains the following schedule:

Loan rate as percent of three-year moving average market price.—1986, 85; 1987, 85; 1988, 80; 1989, 80; and 1990 and thereafter, 75.

Market prices ordinarily would be well above loan rates in effect by 1990. My projections indicate that market prices would initially fall but would later recover to levels above current prices.

To cushion the impact of lower loan rates on producers, target prices need to be retained near current levels until lower market prices and lower real interest and exchange rates have had a chance to decrease output and increase utilization. I suggest that target prices be retained at levels as follows:

Target price as percent of 1985 level.—1986, 100; 1987, 100; 1988, 95; and 1989, 90.

Target prices might continue to be dropped 5 percentage points per year until they reached the level of loan rates. On the other hand, if preserving the middle- and small-size family farm is deemed sufficiently important, the target price would remain at 1985 levels while the payment limit is reduced from $50,000 to $20,000 per operator recipient. The limit could be reduced at an annual rate of $10,000 per year.

Large federal deficits constitute an implicit tax on farmers. Deficiency payments may be viewed as compensation for high real interest and exchange rates. But deficiency payments need to be reduced for agriculture to help restrain federal spending. Therefore, deficiency payments would only be paid on 70 percent of the crop base for each farm (approximately the domestic share of farm output averaged over all farm output). This means that production for domestic use would receive a support price covering resource costs on well-managed farms. Additional output would receive essentially the world price.

Supply control

As noted earlier, a major past failure of major commodity programs is inability to control supply at tolerable Treasury cost. When base acreages and program yields can be easily adjusted and production therefrom made eligible for program benefits, then farmers produce for the supply price offered by program supports. It is important to make the program acreage base and yield independent of current production and price supports so that producers will not increase output to expand program benefits. Some alternatives to accomplish this are:

(1) Set program yields and bases once for the life of a program. Actual acreage and yield of the previous four years would be used to establish program base and yields for the next program. During the life of the program the base for and amounts of deficiency payments would not be reduced if a producer elected not to plant some portion or any of his base allotment.[1]

(2) Set program yields and bases according to a simple five-year moving average of past yields and acreages.

(3) Allotments would be phased out once loan rates reach 75 percent of the three-year average market price—a support price low enough not to generate excess capacity on the average.

Emphasis would be on use of market prices rather than supply control to restrain output. In general, this would mean a low profile for acreage diversion programs. At least two exceptions are noted.

(1) Carryover of most major farm commodities are at reasonable levels for security. An exception is wheat where carryover stocks at approximately 1.5 billion bushels are 50 percent in excess of appropriate levels. In the case of wheat, a major payment-in-kind or other diversion and demand expansion programs seem necessary to reduce stocks to levels that will give producers a fair chance to operate in a market-centered environment.

(2) To avoid charges that the U.S. is using target prices and deficiency payments to subsidize production, it might be useful to require that producers harvest within crop bases to be eligible for program benefits. Also a modest size long-term land retirement program is proposed below.

As long as production controls are in effect (and some paid or unpaid diversion program might be required until real interest and exchange rates fall), only farmers who participate in acreage reduction programs would be eligible for loan and target price features. In 1990 and thereafter, no acreage diversion would be in place and all farmers would be eligible for nonrecourse loans. However, a limit might be set on nonrecourse loans available to any one farm operator. Loans in excess of the maximum would be recourse loans, with principal and interest to be repaid upon loan termination—ordinarily 9 months.

Environment

To hold some reserve production capacity, conserve soil and water, and remove some downward pressure on farm prices, a modest size (no more than 20 million acres) land retirement program would divert erosion-prone land and irrigated (with non-renewable groundwater) land. Diversions would be under long-term contracts, perhaps by bid to remove the most production per dollar cost. Easements would be purchased for cropping rights; land could be grazed or hayed.

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[1] A related alternative if deficiency payments are retained for extended periods is to count only acres harvested up to 70 percent of allotments in making base adjustments for a new program.

Food security

The long-term easement program above would provide some security in the form of reserve production capacity. Two other measures would enhance food security:

(1) The Secretary of Agriculture would be authorized to acquire a security grain reserve of up to 200 million bushels to be used for emergency food relief but insulated from day-to-day market operations.

(2) Farmers who elect to hold buffer stocks (up to a prescribed maximum level) would be provided a payment of 30 cents per bushel per year. No acquisition or release price would be specified; those decisions would be at the producer's discretion.

STATEMENT OF DR. HAROLD D. GUITHER, PROFESSOR OF AGRICULTURAL POLICY, UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

LOAN RATES AND TARGET PRICES

Mr. Chairman, it is certainly an honor and a privilege to share with you and your committee some of the views of farmers in 17 states regarding important aspects of commodity programs, loan rates and target prices as you consider new agricultural legislation.

ABOUT THE SURVEY

The survey was conducted by agricultural economists in 17 states between April and June 1984. They worked together in developing a uniform questionnaire so they could accurately identify similarities and differences of opinion across state lines and among regions of the country.

In each particpating state, a sample of representative farmers was drawn by the research workers, usually in cooperation with the state crop reporting service. Altogether 8,085 farmers responded to the survey in 17 states.

The questions selected centered on the major issues that agricultural policy makers would face in 1985. Today in response to an invitation from the committee, I want to report and discuss those questions that dealt with price support and commodity programs and specifically with loan rates and target prices.

MANDATORY OR VOLUNTARY PROGRAMS?

Farmers across the country were divided in their opinions on the direction they would like farm price and income support policies to take after 1985. However the survey results do reveal some preferences.

In 12 of the 17 states, respondents most frequently preferred the present voluntary programs to mandatory acreage reduction, allotments and marketing quotas, or complete elimination of these programs. However, in Nebraska, Kansas, Oklahoma and Texas, the program direction chosen by the greatest number of farmers was to require that all producers participate in a set aside program approved in a referendum, but in no state was this preference expressed by more than 30 percent of the respondents.

Although some farmers suggested eliminating all set-aside, price support and government storage programs, only in Michigan, Wisconsin, Washington, Idaho, Florida, and Maryland was this the most frequent choice among those suggested. In none of these states was this option favored by more than 35 percent of the respondents and in other states, the percentage ranged from 17 to 34 percent.

If a referendum were held the responses indicate that a majority of farmers would not vote to eliminate price and income support programs. However, the combined responses for (1) keeping voluntary programs and (2) eliminating all set-aside, price support and storage programs indicate that a referendum to establish a mandatory acreage control program would likely fail if either a simple majority or a two thirds majority were required for passage.

TARGET PRICES AND DEFICIENCY PAYMENTS

Target prices and deficiency payments were popular with farmers. Only in Wisconsin and Maryland did more farmers oppose than favor continuation. In 9 of the 17 states more than 50 percent wanted them continued. The least support for target prices was in Michigan, Wisconsin, Idaho, Washington, and Maryland.

Fewer farmers in these states get payments as large as those received by many farmers in the major grain producing states. Greater support for continuing the target prices came from farmers with larger annual sales volumes and from grain farmers.

Farmers were also divided in their opinions where target prices should be set compared to 1984 if the program is continued. In 13 states more farmers preferred that they be kept the same than wanted them changed. In Nebraska, South Dakota, Idaho, and Texas, however, more farmers preferred that they be increased rather than kept the same or reduced. The preference in these states for increased target prices may be due to higher risks associated with farming, the occurrence of drought and other losses in recent years, and the benefits received from deficiency payments when target prices are higher.

Grain farmers and those producing both grain and livestock supported higher target prices more strongly than did livestock and dairy farmers. More of the latter group preferred that they remain unchanged. Only a small segment of farmers preferred lower target prices.

SETTING LOAN RATES

Over the years since the first price support legislation was passed, loan rates for storable commodities have been based on (1) a percentage of parity, (2) a percentage of the average market price at designated times and places, (3) the estimated cash cost of production, or (4) a compromise among various interests in the legislative process.

Farmers were asked whether they agreed or disagreed with the statement that loan rates for price supported commodities should be based on a percentage of the average market price for the past 3 to 5 years.

In 10 of the 17 states, a majority of the farmers agreed with this statement. In all states surveyed but one, more farmers agreed than disagreed. In South Dakota, about the same percentage agreed and disagreed.

The farmers' gross sales volume did not seem to be associated with their views on this issue. The responses in some states showed more support from grain farmers. In other states, however, no difference could be detected among the responses of grain, livestock and dairy farmers.

MORE BENEFITS FOR SMALLER FARMS

In 15 of the 17 states, a higher percentage of farmers agreed than disagreed with the proposition that future farm programs should be changed to give the most benefits to small scale farmers with gross sales less than $40,000. In Texas and Washington, a higher percentage disagreed. The strongest support for providing greater program benefits to small scale farmers was recorded in Maryland, in the north central states, and in the South except for Texas.

As one would expect, farmers with gross sales less than $40,000 showed very strong agreement with the proposal, whereas those with larger gross sales were strongly opposed to the idea. The farmers major source of income did not seem to affect the response to this question.

PAYMENT LIMITATIONS

The 1981 Agricultural and Food Act placed a limit of $50,000 on direct payments to any individual. Respondents were asked what payment limitation policy they preferred. The preference expressed most frequently in 13 of the 17 states was to make no change. In four states—Ohio, Wisconsin, Alabama, and Maryland—the most frequent preference was to decrease the $50,000 limit. Fewer than 17 percent of the respondents in each state wanted the limit eliminated completely. Responses were closely related to the farmers' gross sales volume.

MAKING MAJOR PROGRAM CHANGES

What if budget constraints required major changes in farm price support programs? Farmers surveyed were asked to choose among a low "safety net" loan and target price program, a farm income insurance plan, or a plan they could suggest themselves. In every state except Florida, more farmers preferred a low "safety net" loan and target price price program to a farm income insurance plan. Fewer than 19 percent proposed an alternative plan.

SOIL CONSERVATION AND PRICE SUPPORT

Respondents were asked whether they agreed or disagreed with a statement that all farmers should be required to follow recommended soil conservation practices on their farms to qualify for farm price support benefits. A majority of farmers—from 57 to 71 percent—in every state surveyed agreed with this recommendation.

Operators of all sizes and types of farms concurred. It appears that farmers are more in agreement on this question than on most other issues covered in the survey. However, no explanation or definition of approved soil conservation plans was given, and the costs of following such plans were not mentioned. These issues could affect the response, depending on the individual farmer's situation.

THE FARMER-OWNED RESERVE

Closely related to supporting prices through loans and target prices are the issues related to the farmer-owned reserve. In 16 of the 17 states in which they survey was conducted, more farmers wanted to see the farmer-owned reserve continued than discontinued. In the state of Washington, the response was evenly divided at 40 percent with 20 percent not sure of not responding.

Respondents were also asked to indicate which of several policies they preferred concerning the size of the reserve. In all states, the most frequent choice was to limit the reserve based on a percentage of the previous year's use. This preference was expressed by farmers in all sales classes and with various sources of farm income.

SUMMARY AND CONCLUSIONS

Farmers are divided on many of its issues concerning price and income support programs. However, based on the responses from more than 8,000 farmers in 17 states, on a few issues a majority or near majority agree.

In most states, a majority want to see target prices and deficiency payments continued but they are divided on whether they should be higher, lower, or about the same as in 1984.

In most states, a majority would favor setting loan rates based on a percentage of the 3 to 5 year average market price.

A majority of respondents in every state favor a requirement that farmers follow recommended soil conservation practices on their farms to qualify for price support benefits.

If budget limits require major changes in price support programs, farmers would prefer a lower level loan and target price program over a income insurance or other program.

Farmers generally support an effort to provide greater benefits to farmers with lower gross sales.

Farmers would like to see the farmer-owned reserve continued and that a limit based on a percentage of the previous year's use should be placed on it.

REFERENCES

Guither, Harold D., Bob F. Jones, Marshall A. Martin, Robert G.F. Spitze, U.S. Farmers' Views on Agricultural and Food Policy, North Central Regional Extension Publication 227, North Central Regional Research Publication 300, December 1984. Published at the University of Illinois at Urbana-Champaign.

TABLE 1.—PARTICIPATING STATES, SIZE OF SAMPLE, AND NUMBER OF USABLE RESPONSES

Region and State	Number of farmers in sample	Number of usable responses	Response percentage
North Central:			
Illinois	1,500	527	35
Indiana	1,975	733	37
Kansas	3,000	995	33
Michigan	1,200	441	37
Minnesota	1,500	368	25
Nebraska	1,500	406	27
Ohio	2,000	423	21
South Dakota	1,500	480	32
Wisconsin	1,500	250	17
West:			
Idaho	1,433	558	39
Washington	993	192	19

TABLE 1.—PARTICIPATING STATES, SIZE OF SAMPLE, AND NUMBER OF USABLE RESPONSES—Continued

Region and State	Number of farmers in sample	Number of usable responses	Response percentage
South:			
Alabama	1,479	284	19
Florida	1,466	287	20
Oklahoma	1,750	645	37
South Carolina	1,000	588	59
Texas	1,851	645	35
East: Maryland	1,000	263	26
Total	26,647	8,085	30

TABLE 2.—PREFERRED POLICY ON PRODUCTION AND PRICE SUPPORTS AFTER 1985

[Percentage of respondents]

Region and State	Keep voluntary programs	Require all producers to participate in set-aside program	Reestablish acreage allotments and marketing quotas	Eliminate set-aside, price-support, and Government storage programs	Undecided	Other	No response
North Central:							
Illinois	33	23	8	21	6	7	2
Indiana	31	22	8	26	9	3	2
Kansas	22	26	11	20	9	[1] 9	4
Michigan	28	16	8	32	8	4	4
Minnesota	32	19	12	24	5	5	2
Nebraska	25	28	9	22	7	6	3
Ohio	33	17	10	29	6	4	2
South Dakota	26	14	12	28	8	9	3
Wisconsin	21	16	10	36	9	7	2
West:							
Idaho	25	13	9	34	8	7	4
Washington	25	16	5	36	7	5	5
South:							
Alabama	28	14	15	21	11	2	9
Florida	27	14	17	28	9	2	3
Oklahoma	26	29	....	17	....	[2] 23	[3] 5
South Carolina	26	26	10	18	6	10	4
Texas	15	45	15	8	5	2	10
East: Maryland	26	14	10	33	8	4	5

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[1] Six percent preferred bushel quotas.

[2] Twelve percent preferred eliminating all acreage reduction and price-support programs and retaining deficiency payments only for medium and small farms. Eleven percent preferred eliminating acreage controls and establishing a two-price plan with a higher price for domestic sales and a lower world price for export sales.

[3] Combined percentage of those who did not respond and those who suggested other programs not included in footnote 2.

TABLE 3.—OPINIONS ON CONTINUATION OF TARGET PRICES AND DEFICIENCY PAYMENTS IN THE 1985 FARM BILL

[Percentage of respondents]

Region and State	Continue	Do not continue	Not sure	No response
North Central:				
Illinois	58	30	10	2
Indiana	52	31	15	2
Kansas	61	25	12	3
Michigan	44	42	2	12
Minnesota	54	29	13	3

TABLE 3.—OPINIONS ON CONTINUATION OF TARGET PRICES AND DEFICIENCY PAYMENTS IN THE 1985 FARM BILL—Continued

[Percentage of respondents]

Region and State	Continue	Do not continue	Not sure	No response
Nebraska	60	28	11	1
Ohio	48	37	13	2
South Dakota	67	22	9	3
Wisconsin	33	46	14	7
West:				
Idaho	45	40	12	3
Washington	44	42	10	4
South:				
Alabama	45	27	19	9
Florida	44	35	18	3
Oklahoma	62	24	[1] 14	
South Carolina	52	25	15	8
Texas	75	11	6	8
East: Maryland	32	43	24	2

[1] Includes those who did not respond.

TABLE 4.—PREFERRED FUTURE TARGET PRICES COMPARED WITH THOSE OF 1984

[Percentage of respondents]

Region and State	Higher	About the same	Lower	No opinion	No response
North Central:					
Illinois	34	41	8	9	8
Indiana	35	37	7	10	11
Kansas	35	39	5	8	13
Michigan	27	32	10	10	20
Minnesota	33	38	6	9	15
Nebraska	44	30	5	9	12
Ohio	30	34	9	10	17
South Dakota	42	41	5	9	3
Wisconsin	12	32	10	9	38
West:					
Idaho	25	20	2	4	49
Washington	17	29	6	5	44
South:					
Alabama[1]	21	29	13	15	23
Florida	29	31	5	18	17
Oklahoma	31	45	7	[1] 17	
South Carolina	31	35	4	12	18
Texas	56	24	3	6	11
East: Maryland	18	32	12	20	17

[1] Includes those who did not respond.

TABLE 5.—OPINIONS ON CONTINUATION OF ACREAGE DIVERSION PAYMENTS

[Percentage of respondents]

Region and State	Continue	Do not continue	Not sure	No response
North Central:				
Illinois	49	36	13	2
Indiana	46	38	13	2
Kansas	57	30	10	3
Michigan	43	46	9	2
Minnesota	57	30	10	3

TABLE 5.—OPINIONS ON CONTINUATION OF ACREAGE DIVERSION PAYMENTS—Continued

[Percentage of respondents]

Region and State	Continue	Do not continue	Not sure	No response
Nebraska	58	30	11	1
Ohio	47	38	13	3
South Dakota	60	27	11	2
Wisconsin	34	50	9	7
West:				
Idaho	43	44	10	4
Washington	39	46	10	5
South:				
Alabama	37	41	16	6
Florida	47	37	13	3
Oklahoma	57	32	[1] 10	....
South Carolina	50	29	13	8
Texas	72	15	5	8
East: Maryland	34	48	15	3

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[1] Includes those who did not respond.

TABLE 6.—OPINIONS ON CONTINUATION OF THE FARMER-OWNED GRAIN RESERVE

[Percentage of respondents]

Region and State	Continue	Do not continue	Not sure	No response
North Central:				
Illinois	48	30	20	2
Indiana	49	26	24	2
Kansas	45	31	22	2
Michigan	46	30	21	3
Minnesota	59	25	13	3
Nebraska	61	24	13	2
Ohio	51	28	20	2
South Dakota	57	23	18	2
Wisconsin	43	34	17	6
West:				
Idaho	46	31	19	3
Washington	40	40	16	4
South:				
Alabama	50	19	23	8
Florida	53	22	23	2
Oklahoma	46	32	[1] 22	....
South Carolina	45	21	26	8
Texas	45	22	24	9
East: Maryland	45	24	28	3

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[1] Includes those who did not respond.

TABLE 7.—PREFERRED POLICY FOR LIMITING THE SIZE OF THE GRAIN RESERVE

[Percentage of respondents]

Region and State	No limit on size of reserve	Let Secretary of Agriculture set limit	Set limit based on percentage of previous year's use	Not sure	No response
North Central:					
Illinois	9	18	47	18	8
Indiana	10	15	47	20	9
Kansas	9	14	41	23	13
Michigan	13	13	43	18	14

TABLE 7.—PREFERRED POLICY FOR LIMITING THE SIZE OF THE GRAIN RESERVE—Continued

[Percentage of respondents]

Region and State	No limit on size of reserve	Let Secretary of Agriculture set limit	Set limit based on percentage of previous year's use	Not sure	No response
Minnesota	13	16	42	18	11
Nebraska	13	16	44	18	10
Ohio	11	13	50	13	13
South Dakota	10	17	49	21	3
Wisconsin	6	10	45	14	25
West:					
Idaho	8	8	26	8	49
Washington	11	7	23	9	50
South:					
Alabama	12	14	41	19	14
Florida	11	15	44	21	9
Oklahoma	9	14	47	30	
South Carolina	9	14	40	20	17
Texas	13	9	40	25	13
East: Maryland	7	11	47	22	13

TABLE 8.—RESPONSES TO THE STATEMENT THAT LOAN RATES SHOULD BE BASED ON A PERCENTAGE OF THE 3- TO 5-YEAR AVERAGE MARKET PRICE

[Percentage of respondents]

Region and State	Strongly agree	Agree	Not sure	Disagree	Strongly disagree	No response
North Central:						
Illinois	9	46	17	14	10	4
Indiana	8	42	20	17	8	5
Kansas	6	34	20	20	13	6
Michigan	10	42	19	16	10	4
Minnesota	12	40	16	19	9	4
Nebraska	10	34	20	19	12	6
Ohio	10	42	18	16	9	5
South Dakota	4	33	21	24	14	4
Wisconsin	8	44	20	12	10	5
West:						
Idaho	10	36	20	17	12	5
Washington	8	36	21	16	12	7
South:						
Alabama	15	40	20	10	6	9
Florida	13	47	16	12	8	4
Oklahoma	10	45	18	15	9	[1] 3
South Carolina	12	47	15	12	4	10
Texas	13	32	15	16	14	10
East: Maryland	7	39	26	12	7	10

[1] Includes those who made other responses or did not respond.

MARCH 19 HEARING—IMPACT OF TECHNOLOGY AND RESEARCH

STATEMENT OF HON. EDWARD ZORINSKY, A U.S. SENATOR FROM NEBRASKA

Mr. Chairman, many observers believe that the support of research and extension activities may be the greatest long-term contribution to agriculture that Congress can make. Various technologies that were developed with support of Congress have significantly affected the structure of agriculture in the United States, and over the years the focus of our research and extension activities have changed.

Prior to 1925 most of the increase in the production of food and fiber in this country resulted from the expansion of acreage used as farmland. Since that time, the increase in agricultural production has largely been the result of the scientific research and the application of new technologies to farming.

The development of fertilizers and pesticides, as well as new mechanical means of cultivation, sharply reduced the labor requirements of farming in the last 60 years. During this same period, increased knowledge from biological research resulted in new hybrids and antibiotics that further increased production. These developments have had a substantial effect upon not only the economic structure of agricultural and rural America, but also on the Nation as a whole.

Unquestionably, new technologies and biological applications that resulted in greater productivity have ensured our citizens of an abundance of relatively inexpensive food and fiber. However, they have also contributed to the development of surpluses that have been difficult and expensive to manage.

Over time, many of the production enhancing technologies have become increasingly expensive to use. This is because they involve the extensive use of energy and chemicals, as well as large outlays of capital. Therefore, continued emphasis on these energy and capital intensive technologies may not be economically feasible to many of our financially hard-pressed farmers.

However, there is a need for continuing research and development of new technologies and practices that will result in reduced cost of production of commodities and improved productivity of our soil. Technological breakthroughs in these areas would directly benefit farms of all sizes and would undoubtedly cause fewer environmental concerns than an expanded use of chemicals to increase production. Such developments would also serve to reduce our Nation's dependence on foreign supplies of petroleum and chemicals for agricultural production.

Mr. Chairman, many new technological advances will be made in the foreseeable future. Some will have application to farming and will undoubtedly have a substantial impact upon the structure of agriculture in this country.

I look forward to the testimony of today's witnesses.

STATEMENT OF HON. PATRICK J. LEAHY, A U.S. SENATOR FROM VERMONT

Mr. Chairman, sometimes the immediate problems that confront farmers distract our attention from the long-term problems that are vitally important to agriculture's future. Support for agricultural technological advances and the research that leads to such advances may well be one of the most important activities that Congress undertakes.

Agricultural technological advances in the past—advances that multiplied the yield per acre of corn and other crops, produced crop varieties that are more disease resistant and adaptable to different climates, and led to more efficient production of animal protein—provide us with a record that any industry would boast about.

The effect of these advances has been production, in many cases, of too much product for the existing market demand. Yet, the abundance of agricultural goods has given us a unique position in the history of the world: the ability to feed ourselves, to feed our allies, and to share our abundance with the famine-stricken people of other nations. As a nation, we need not fear that we will be starved into submission. I believe agriculture provides a sharp contrast with our dependence on foreign supplies of energy, for example.

We can thank those who carried out research in the past for much of our success in agriculture.

But looking to the past is not enough. We need to view the future for agriculture with a clear vision of what technological advances can make available. For example, work on the bovine growth hormone may result in a dramatic and rapid increase in milk output per cow. How will we use this technological advance? Will the hormone be another blessing bestowed by research, or will it precipitate a sudden decline in the number of dairy farms?

The use of technological opportunities is itself a topic for further research, and I hope the committee will have the benefit of testimony—today and in the future—that guides us to understand both the nature of the technological breakthroughs and the implications for agricultural policy and rural residents.

Mr. Chairman, I look forward to today's testimony.

STATEMENT OF DR. MICHAEL J. PHILLIPS, PROJECT DIRECTOR, FOOD AND RENEWABLE RESOURCES PROGRAM, OFFICE OF TECHNOLOGY ASSESSMENT, U.S. CONGRESS

Mr. Chairman and Members of the Committee: Thank you for inviting the Office of Technology Assessment (OTA) to appear before you today to release findings from the first part of a major study this committee and others requested which will provide information for your consideration in drafting the 1985 Farm Bill. I am Dr. Michael Phillips, Project Director of the requested study. Accompanying me today are Dr. B.R. Eddleman, Mississippi State University, and Dr. James R. Richardson, Texas A&M University, who are a part of the project team for this study.

The study "Technology, Public Policy, and the Changing Structure of American Agriculture" projects the most likely picture of U.S. agriculture by the year 2000 by analyzing the relationships between emerging agricultural technologies, public policy and structural change in the farm sector. Committees requesting this study expressed major concern about the lack of knowledge of the nature and impacts of emerging technologies in combination with public policy specifically as they affect the future direction of agriculture.

Although the entire study will not be completed until late 1985, some findings from the study we find are relevant to the debate of the 1985 Farm Bill. We have prepared and today transmitted to the requesting committees the first of two reports which is entitled "Technology, Public Policy, and the Changing Structure of American Agriculture—A Special Report for the 1985 Farm Bill." Today our purpose is to (1) describe briefly some of the new technologies, (2) discuss their impact on future yields and total production, and (3) indicate their likely impact on structural change and agricultural policy.

EMERGING AGRICULTURAL TECHNOLOGIES

Technology has made U.S. agriculture one of the most productive in the world. Some of that technology has taken the form of new products (chemicals to control pests, drugs to control disease, or sensors and computers that automatically measure moisture conditions). Other technology has been embodied in new processes—such as the ability to use computers, to make better economic decisions, or to apply the best combination of cultural practices. Emerging technologies encompass both products and processes and like their predecessors, promise to reshape agriculture practices. Indeed, recent breakthroughs in biotechnology and information technology could revolutionize agricultural production.

For instance, before the turn of the century, cattle ranchers may be able to raise cattle twice their present size with no additional feed; dairy farmers may be able to control the sex of calves and to increase milk production without increasing feed intake; major crops may be altered genetically to resist pests and disease, to grow in salty soils and harsh climates, and to provide part of their own fertilizer; and new computers and electronics will be used to increase farm management efficiency. These are only a few of about 150 emerging technologies in 28 technological areas that have been identified and evaluated for this study (Table 1). While it may sound somewhat like science fiction, advances in biotechnology and information technology will make these technologies a reality in the very near future.

BIOTECHNOLOGY

One of the major thrusts of genetic engineering in animals is the mass production in microorganisms of proteinaceous pharmaceuticals, including a number of hormones, enzymes, activating factors, amino acids, and feed supplements. One application of these new pharmaceuticals is in the injection of growth hormones into animals to increase productivity. Several firms are developing genetically engineered bovine growth hormones to stimulate lactation in cows. Trial results show that each cow treated with the hormone increased milk production by at least 12 percent without increasing feed intake. Commercial introduction of the new hormone now awaits approval by the Food and Drug Administration (FDA).

A new technique arising from the convergence of gene and embryo manipulations promises to permit genes carrying new traits to be inserted into the reproductive cells of livestock and poultry opening a new world of improvement in animal health and productivity. Unlike genetically engineered growth hormone, which increases an animal's productivity but does not affect future generations, this technique will allow future animals to be permanently endowed with traits taken from other animals and humans, and probably also of plants.

In 1983, scientists at the University of Pennsylvania and University of Washington successfully inserted a human growth hormone gene, a gene that produces growth hormone in human beings, into the embryo of a mouse to produce a "supermouse" that grew to more than twice the size of a normal mouse. In another experiment, scientists at Ohio University inserted rabbit genes into the emryos of mice. The genetically engineered mice, which were 2.5 times larger than normal, ate only as much as normal mice.

Embryo transfer in cows, another technology, involves the artifical insemination of a super-ovulated donor animal. The resulting embryos are removed nonsurgically for implantation in surrogate mothers. Prior to implantation, the embryos can be treated in a number of special ways. They can be sexed, split (generally to make twins), fused with embryos of other animal species (to make chimeric animals or to permit the heterologous species to carry the embryo to term) or frozen in liquid nitrogen. Freezing is of great practical importance because it allows embryos to be stored until the estrus of the intended recipient on the farm is in synchrony with that of the donor. While less than 1 percent of U.S. cattle are involved in embryo transfers, the obvious benefits will push this percentage upward rapidly, particularly as the costs of the procedure decrease.

The application of biotechnology in plant agriculture could modify crops so that they would make more nutritious protein, resist insects and disease, grow in harsh environments, and provide their own nitrogen fertilizer. While the immediate impacts of biotechnology will be greater for animal agriculture, the long-term impacts are likely to be substantially greater for plant agriculture. I will discuss two potential applications of biotechnology to plant agriculture—microbial inoculums and genetic modification.

Rhizobium seed inoculums are widely used to improve nitrogen fixation by certain legumes. Extensive study of the structure and regulation of the genes involved in bacterial nitrogen fixation will likely lead to the development of more efficient inoculums. Research on other plant colonizing microbes has led to a clearer understanding of their role in plant nutrition, growth stimulation, and disease prevention, and the possibility exists for their modification and use as seed inoculums.

Presently, field tests are being conducted of genetically engineered soil bacteria that produce natural insecticides capable of protecting plant roots against soil-dwelling insects. A genetic engineering technique has been developed that inserts into soil bacteria a gene from a microorganism known as Bacillus thuringiensis, which has been registered as an insecticide for at least two decades. Plant seeds can be coated with these bacteria before planting. As the plants grow from these buds, the bacteria remain in the soil near the plant roots, generating an insecticide that protects the plants.

The targets of crop improvement via genetic modification are essentially the same as those of traditional breeding approaches: increased yield, improved qualitative traits, and reduced labor and production costs. However, the newer technology offers the potential to accelerate the rate and type of improvements beyond that possible by traditional breeding.

Of the various biotechnological methods that are being used in crop improvement, plant genetic engineering is the least established but the most likely to have a major impact. Using gene transfer techniques, it is possible to introduce desoxyribonucleic ancid (DNA) from one plant into another plant, regardless of normal species and sexual barriers. For example, it is possible to introduce storage protein genes from French bean plants into tobacco plants and to introduce genes encoding photosynthetic proteins from pea plants into petunia Plants.

Transformation technology also allows introduction of DNA coding sequences from virtually any source into plants, providing they are engineered with the appropriate plant-gene regulatory signals. Several bacterial genes have now been modified and shown to function in plants. By eliminating sexual barriers to gene transfer, genetic engineering will greatly increase the genetic diversity of plants.

INFORMATION TECHNOLOGY

One of the must significant changes in future livestock production will come from the integration of computers and electronics into a modern livestock production system, technology that will help the farmer improve management.

Computers and electronic devices can be used efficiently in animal feeding, reproduction, disease control, and environmental control. The first step toward efficient management will be with electronic animal identification. Positive identification of animals is necessary in all facets of management, including recordkeeping, individualized feed control, genetic improvement, and disease control. Animals will be identified soon after birth with a device that will last the life of the animal. The device will be readable with accuracy and speed from 5–10 feet for animals in confinement and at much greater distances for animals in feedlots or on pasture. Research on identification systems for animals has been in progress for some years, especially for dairy cows. For example, an electronic device now used on dairy cows is a transponder that is worn in the ear or on a neck chain. A feed-dispensing device identifies the animal by its transponder and feeds the animal for maximum efficiency, according to stage of production. It also permits animals in different stages of production to be penned together yet still be maintained on its own special diet.

The largest potential use of electronic devices in livestock production will be in the area of reproduction and genetic improvement. An inexpensive estrus detection device, for example, would prove profitable in several ways.

Animals could be rebred faster after weaning and increase the number of litters per year.

Animals that did not breed could be culled from the herd, saving on feeding and breeding space.

Time would be saved because breeding would be done faster.

Embryo transplants would be easier because of better estrus detection.

TECHNOLOGY'S IMPACT ON FUTURE YIELD AND PRODUCTION

A basic question is what do all these technologies mean for argiculture? First, it should be noted that for plant argiculture many of the biotechnology developments still are a number of years away from commercialization. A great deal of basic research needs to be done before many of the promising areas of biotechnology can be realized. The earliest to look for some of these breakthroughs is the early-to-mid 1990s. That means we will continue to rely on conventional techniques and plant breeding programs until that time. Yield increases for corn, soybeans and wheat will range from 3.5 to 8 percent nationally until 1990. However, from 1990 to 2000 when some of the new technologies are available, yields should increase by 15 to 17 percent (Table 2).

In animal argiculture we have a much different situation. The technologies are here today and they will have a major impact for the remainder of the century. This will be the case especially for the dairy industry. We estimate that if the present economic environment and policy programs remain unchanged (baseline environment), technological advance will have the potential to increase from 1982 national milk production per cow 14 percent by 1990 was 43 percent by 2000. This translates into a 2 percent per year annual increase in potential milk production from now to 2000. Such a dramatic increase in milk production potential coupled with a relatively static demand for milk products since 1977, indicate a continued and worsened surplus situation for the dairy industry.

Table 3 shows projections to 2000 of increased production based on the yield projections for three major U.S. export commodities. Under the baseline or most likely environment, corn production is projected to increase at the rate of 1.8 percent per year from 1981 to 2000. However, without the new technologies examined in this study, the rate of growth would be only 1.2 percent. Under the more-new-technology environment, corn production would increase at a much faster rate—2.2 percent per year. About the same growth rates were obtained for wheat production. A more drastic increase in soybean production is projected from now until 2000 regardless of the environment considered.

Out of a predicted 1.8 percent annual increase in production to meet world demand, only 0.3 percent will come from an increased quantity of land used in production in the next 20 years. The other 1.5 percent will have to come from increases in yields—mainly from new technology. Thus, to a very large extent, research that produces new technologies will determine the future world supply—demand balance and the amount of pressure placed on the world's limited resources.

The OTA results indicate that with continuous inflow of new technologies into the argicultural system, U.S. argiculture will be able not only to meet domestic demand but also contribute significantly to meeting world demand in the next 20 years. This does necessarily mean that the United States will be competitive or have the economic incentive to produce. It merely means that the United States will have the technology available to provide the production increases needed to export for the rest of this century.

Under the baseline environment, growth rates in production, which include additional land resources and new technology, will be adequate to meet the 1.8 percent needed to balance world supply and demand in 2000. Under the more-new-technology environment, production would increase at 2.2 percent per year, which would be more than enough to meet projected world demand. This increased production could, however, point to a future of surplus production. On the other hand, under the less-new-technology environment the production of major crops in 2000 would drop to 1.6 percent per year, a growth rate that would not be able to meet demand. Under the no-new-technology environment, the annual rate of production growth would be reduced further to 1.1 percent. It should be noted that if the current administration proposal to reduce the argicultural research budget is accepted by Congress, the rate of production growth would be between 1.1 to 1.6 percent.

IMPLICATIONS FOR STRUCTURAL CHANGE AND AGRICULTURAL POLICY

Advances in biotechnology and information technology will be needed for the U.S. to compete in the international market place. However, the potential impacts of adopting these technologies have important policy implications for Congress as it begins debate on the 1985 Farm Bill.

One impact will be technology's role, along with current public policy, in creating a surplus of certain commodities—notably dairy products—in the immediate future. The implication for policymakers is the need for a farm program that more easily allows for adjustments in periods of shortages and surpluses rather than remaining fixed. For example, dairy price supports could be designed to adjust to increased production and lower costs spurred by technological advance. This could be accomplished either by adjusting the price support level to changes in production costs per unit of output or by adjusting the level of CCC purchases.

Another impact of technology will be its continuing role in changing the structure of the agricultural sector from a system dominated by the moderate-size farm (a farm with $100,000 to $199,000 in annual sales), to one dominated by large and very large industrialized farms (farms with sales in excess of $200,000). For example, in the dairy sector our analysis indicates that with the adoption of emerging technologies and present public policy, there will be a continued trend to fewer but larger dairies. Regionally milk production can be expected to continue to increase in the large-scale, lower-cost Southwest region to the detriment of the traditional moderate-size operations in the Lake States and Northeast regions.

In addition, the technologies a farmer now needs to remain competitive are going to be costly and complex. Farmers who lack the capital and expertise to adopt technology early enough to maintain a competitive edge probably will have to seek supplementary off-farm income, find some special niche for their products, or give up farming altogether. This last alternative has become a familiar picture for the moderate-size farm which is fast disappearing from the agricultural scene. Since 1974 net income of moderate farms has decreased from 21 percent to 15 percent of total farm income in 1982. In contrast, net farm income of those farmers with sales in excess of $200,000 grew from 35 percent to 84 percent in the same period (Table 4). Very large farms (farms with sales in excess of $500,000) have been responsible for the majority of this growth. This class, which accounts for only 1.2 percent of all farms, increased its real share of net farm income fourfold—from 16 to 64 percent. As a group, these large and very-large farms are relatively well-off. As the moderate farm drops from the middle of the farm spectrum it leaves small and part-time farms (whose owners earn their primary income elsewhere) clustered at one end and the large farms (whose owners can take advantage of economies of scale) clustered at the other.

Moderate farms comprise most of the farms that depend on agriculture for the majority of their income. Traditionally, the moderate farm has been viewed as the backbone of American agriculture. These farms appear to be failing in their efforts to compete for their historical share of farm income.

This trend has several implications for public policy. First, if a decision is made to slow the decline of the moderate-size farm, policymakers must provide ways for: 1) making new technologies more available to these farms, and 2) providing training in the use of these technologies. This could be accomplished from both the public and private sector efforts. For example, cooperatives, whose membership is primarily composed of operators of moderate-size farms, could arrange for "pool buying" of these technologies for their members and develop training programs for their appropriate use. In the public sector, a tremendous challenge exists for the extension service to transfer these technologies to moderate-size farms early enough in the adoption cycle for them to remain competitive. Dr. Eddleman will discuss further technology transfer by the public sector.

Second, our analysis indicates that targeting income support to operators of moderate-size farms could be an effective policy to prolong their survival. And despite the apparent advantages of operators of very large farms, they may need a loan safety net to help them weather price instabilities and the rigors of the world marketplace. Unlike most of their moderate-size counterparts, such farms are more likely to survive without income supports. Dr. Richardson will discuss this in more detail.

Third, agricultural policy may for the first time have to include ways to help particular groups and regions make the transition to different endeavors. For example, program to retrain agricultural workers for jobs in other sectors of the economy may be necessary, or farm operators in a region may need help changing to alternative kinds of farming.

Finally, and perhaps most significantly, farm programs must be considered in the context of these strong technological, economic and institutional forces. Farm programs can merely speed up or slow down these forces of change—they cannot reverse the trends.

After Dr. Richardson and Dr. Eddleman have made their brief statements, we will be glad to try and answer any questions you might have.

Table 1.—Emerging Agricultural Production Technology Areas

Animal	Plant, soil, and water
Genetic engineering	Genetic engineering
Animal reproduction	Enhancement of photosynthetic efficiency
Regulation of growth and development	Plant growth regulators
Animal nutrition	Plant disease and nematode control
Disease control	Management of insects and mites
Pest control	Weed control
Environment of animal behavior	Biological nitrogen fixation
Crop residues and animal wastes use	Chemical fertilizers
Monitoring and controlling	Water and soil-water-plant relations
Communication and information	Soil erosion, productivity, and tillage
Telecommunication	Multiple cropping
Labor-saving technologies	Organic farming
	Communication and information management
	Monitoring and controlling
	Telecommunications
	Labor-saving technologies
	Engine and fuels
	Land management
	Crop separation, cleaning, and processing

SOURCE: Office of Technology Assessment.

Table 2.—Estimates of Crop Yields and Animal Production Efficiency

		No-new-technology environment		Baseline environment		More-new-technology environment	
	1982	1990	2000	1990	2000	1990	2000
Corn bu per acre	115	117	124	119	139	121	150
Cotton lb per acre	481	502	511	514	554	518	571
Rice bu per acre	105	105	109	111	124	115	134
Soybean bu per acre	30	32	35	32	37	33	37
Wheat bu per acre	36	38	41	39	45	40	46
Beef							
Pounds meat per lb feed	0.070	0.071	0.066	0.072	0.072	0.072	0.073
Calves per cow	0.90	0.94	0.96	0.95	1.0	0.95	1.04
Dairy							
Pounds milk per lb feed	0.94	0.94	0.95	0.95	1.03	0.96	1.11
Milk per cow per year (thousand lb)	12.3	13.7	15.7	14.0	17.6	14.2	19.3
Poultry							
Pounds meat per lb feed	0.44	0.52	0.53	0.53	0.57	0.53	0.58
Eggs per layer per year	245	255	260	258	275	257	281
Swine							
Pounds meat per lb feed[a]	0.165	0.167	0.17	0.17	0.176	0.17	0.18
Pigs per sow per year	14.4	14.8	15.7	15.2	17.4	15.5	17.8

[a] The value shown for swine feed efficiency for 1982 is the average of national feed efficiencies for the 10 years prior to 1982. The national aggregate linear trend of swine feed efficiency is slightly negative and gives a value of .157 in 1982.

SOURCE: Office of Technology Assessment.

Table 3.—Projection of Major Crop Production

Crop	Unit	1981	2000 No-new-technology environment	2000 Baseline environment	2000 More-new-technology environment
Corn					
Production	Million bushels	8,136	10,289.0	11,498.0	12,394.0
Growth rate	Percent		1.2	1.8	2.2
Wheat					
Production	Million bushels	2,704	3,273.0	3,825.0	4,063.0
Growth rate	Percent		1.0	1.8	2.2
Soybean					
Production	Million bushels	1,953	3,067.0	3,311.0	3,351.0
Growth rate	Percent		2.4	2.8	2.9

SOURCE: Office of Technology Assessment.

Table 4.—Distribution of Farms, Percent of Cash Receipts, Percent of Farm Income, and Farm and Off-Farm Income per Farm by Sales Class, 1982

Sales Class	Value of farm products sold	Number of farms	Percent of all farms	Percent of total cash receipts	Percent of net farm income	Average net farm income	Average off-farm income	Average total income
	Less than $5,000	814,535	36.4	1.2	-2.0	($550)	$20,396	$19,846
Small	$5,000–$9,999	281,802	12.6	1.5	-0.9	(700)	22,498	21,798
	$10,000–$19,999	259,007	11.6	2.8	-0.9	(780)	18,648	17,868
Part-time	$20,000–$39,999	248,825	11.1	5.4	0.2	154	14,134	14,288
	$40,000–$99,999	332,751	14.9	16.4	5.2	3,451	12,529	15,980
Moderate	$100,000–$199,999	180,689	8.1	19.1	14.6	17,810	11,428	29,238
Large	$200,000–$499,999	93,891	4.2	21.0	20.4	48,095	12,834	60,929
Very Large ...	$500,000 and over	27,800	1.2	32.5	63.5	504,832	24,317	529,149
	All farms	2,239,300	100.0	100.0	100.0	$9,976	$17,601	$27,578

SOURCES: Adapted from *Economic Indicators of the Farm Sector; Income and Balance Sheet Statistics, 1983*, USDA Economic Research Service, 1984, Table 58, using farm number and cash receipts distribution data from the 1982 Census of Agriculture, Dept. of Commerce, Bureau of the Census, 1984.

STATEMENT OF DR. B.R. EDDLEMAN, PROFESSOR AND ECONOMIST, MISSISSIPPI AGRICULTURAL AND FORESTRY EXPERIMENT STATION, MISSISSIPPI STATE UNIVERSITY

Mr. Chairman and Members of the Committee: I appreciate the opportunity to discuss with you the implications for research and extension policy in the 1985 Farm Bill that emerged from the Office of Technology Assessment (OTA) study on technology, public policy, and the changing structure of American agriculture.

Agriculture's entrance into the era of biotechnology and information technology raises several questions about the impact of technological advance on the performance of the research and extension system and about how that performance will ultimately affect the structure of agriculture. For example:

Who is likely to gain and who is likely to lose from the process of technological change in agriculture related to the biotechnologies and informatioin technologies?

Will the agricultural research and extension programs in biotechnology and information technology be structurally neutral or will it favor the large more industrialized farms?

What are the roles of the various components of the agricultural research and extension system as they relate to technological change in the biotechnology and information technology era?

What are the implications of increased private sector involvement in the agricultural research?

What are the implications of patents being conferred on biotechnology and information technology discoveries for the social contract under which the agricultural research system was created?

What is the implications for extension's role in education and new product evaluation in the biotechnology era?

WHO GAINS FROM THE TECHNOLOGY CHANGE

Three important conclusions emerge from past studies of technology change in agriculture regarding who benefits and who loses from such technology advance and the implications for structural change in farming. We believe these conclusions also characterize the potential distribution of costs and benefit from new biotechnologies and information technologies for agriculture.

Those farmers who are most aggressive in effectively adopting and applying new technologies are the most likely to survive over time. Their size or scale of operation thereby influences the structure of agriculture. To the extent that research discoveries or extension programs favor farm operations of a certain scale, the structure of the farming industry is affected by the research and extension. The significance of technology's role in fostering structural change makes it an important factor to consider when designing research and extension programs.

Research and extension are vital to maintaining the competitiveness and comparative advantage of U.S. agriculture in international trade. Competition in export markets is becoming increasingly keen as countries strive to expand agricultural output and export to earn foreign exchange. Maintaining and/or increasing the U.S. share in agricultural export markets cannot be maintained without the benefit of continuous development and adoption of cost-reducing technologies.

The ultimate beneficiary of agricultural research and extension is the consumer—domestic and foreign. Larger supplies, lower food prices, and better quality have almost invariably been the main results of the agricultural research. This does not mean that research operates contrary to the interest of all farmers; rather, research directly benefits the more progressive farmers who are the first to adopt the research results. Research is also critical for expanding markets for farm products and for overcoming the constant threat of disease and other vagaries of nature.

THE EFFECT OF AGRICULTURAL RESEARCH AND EXTENSION ON FARM STRUCTURE

The impacts of research and extension on farms, farm workers, agribusinesses and rural communities depend on the type of technology developed and the rate of adoption. Their impacts on the structure of the farming industry can best be understood by considering the separate effects of research, extension, and technology adoption.

A research program that is structurally neutral would develop technologies that can be used by any size farm. Available evidence indicates that the biological-chemical technologies, the focus of most land grant university and USDA research, are more likely to be structurally neutral than is mechanical research, which is primarily done in the private sector. The biological-chemical technologies over the past 50 years have accounted for about a doubling of output in most farm commodities—

e.g., wheat, corn, rice, and cotton—on all size of farms. However, mechanization and economies of size have accounted for a tenfold to twentyfold increase in output of these commodities, and this has not been structurally neutral. We find little evidence to indicate that research to develop biotechnologies and information technologies are likely to be biased toward any particular size of farm.

Dissemination that is structurally neutral entails the providing of the research results by researchers and extension staff to all farmers. Although the extension service disseminates research results through a wide range of publications, public meetings, and result demonstrations, these means are more readily accessed by the more knowledgeable and better educated farmers, who more often are the operators of larger, more progressive farms. To this extent, dissemination of current research results that encompass the topics covered in publications and public meetings tends to be less structurally neutral than the research itself. A counter argument often heard is that the operators of the larger, more progressive farms are more knowledgeable about the state of the art than are extension staff.

Adoption that is structurally neutral involves equal willingness and ability of operators of all farm sizes to adopt new technology. Even when research and extension activities are structurally neutral, adoption may not be neutral because it is dependent on many factors, including the potential profitability of the technology, the capital investment required for adoption, the natural resources controlled by farmers, the economic environment within which farmers operate, and the technical and managerial skills of the farmer.

Considering the number and complexity of these factors, it would be difficult to achieve a farm structure that maintains the moderate-size commercial farm simply by focusing more research and extension resources on producing and disseminating technologies specifically oriented toward this farm segment. Instead, research and extension activities would have to be integrated into other targeted policy tools to achieve such structural goals.

PRIVATE SECTOR RESEARCH AND EDUCATION

With the advent of biotechnology, the interest of private firms in agricultural research increased sharply. Substantially expanded resources have been invested in plant and animal reproduction designed to produce new varieties or to expand the rate of genetic improvement. Increased private-sector interest is also being shown in developing disease- and insect-resistant plants as well as in more organic methods of pest control.

A major reason for this expanded private sector interest in agricultural research has been the extension of patent rights to plant varieties and other biological discoveries. These rights, in turn, gave rise to increased private sector interest in supporting university research that could result in profitable, patented discoveries.

For most agribusiness firms, the role of education is pursued in conjunction with their efforts to promote the products and services that they market. The educational value to farmers relates more to alerting them to the availability of new products than to evaluating the performance of those products on farms.

PUBLIC SECTOR RESEARCH ROLES

The policy changes relating to property rights and exclusivity rules for research outputs that have occured over the past 15 years holds potential for substantially changing the traditional concept of ready and free public access to land grant university research results.

Relationships are developing between private sector research firms and public universities (both land grant and non-land grant) to provide for limited partnerships to develop and market innovations arising from private sector investments in public agricultural research. Questions arise over who should maintain the property right—the university, the private firm, or the scientist making the discovery. In most cases, the university retains the patent rights while the private firm receives exclusive licensing rights. In some cases, the scientist or inventor gets a certain percentage royalty or a stock option in the limited partnership.

Property right and exclusivity rules potentially have profound implications on the unique nature or "social contract" of the land grant system. Private sector arrangements now integrate business into the university fabric. Questions develop over who controls the university research agenda, the allegiance of scientists to their university employees, the willingness of scientists to discuss research discoveries related to potentially patentable products, and potential favoratism shown particular companies by the university because of its research ties.

The advent of patent rights and exclusive licensing, as a condition for private sector investment in public sector research, may change the distribution of benefits from land grant university research discoveries for a number of reasons:

By exclusive licensing or transferring of patent rights to private firms, the right to use discoveries is no longer freely available—even if the information on the discovery itself is freely available.

Certain individuals and firms are conferred the benefits of specific land grant research, to the potential detriment of others. Prior to the transfer of discovery rights, the benefits were available to anyone who adapted a land grant discovery to commercial use.

The costs of the discoveries are internalized in the price of the resulting product. The price the public pays for the product also includes any monopoly rents associated with the conferral of the rights. Society thus pays twice; once for a portion of the costs of the research and again for its benefits. Without the conferral of property rights, rents are minimized by competition.

Private sector-public sector inequities are virtually assured in any granting of research property rights to an individual firm. This occurs because a relatively small private sector investment gains access to a much larger public sector base and broader range of current and prior research.

The extent of patent rights, trade secrets, and confidential information has many potentially adverse implications for extension in terms of the increased burden for product testing, the potential lags in information, and the absence of research information that previously would have been readily available.

Counterbalancing arguments for the conferral of private sector property rights by the land grant universities include:

With the conferral of private property rights and the associated private sector investment, the quantity of research discoveries may increase.

Without involvement in private sector-funded research, the land grant universities may not be able to retain the top-quality scientists in the system. Thus, the agricultural research, extension and graduate teaching programs would all suffer.

Patent monopoly rights may be required to attract the capital investment needed to translate the scientific discoveries of land grant universities into commercial reality.

EXTENSION ROLES

Available evidence suggests that the progress of the agricultural research community in establishing priorities is more advanced than that of that extension community. The agricultural research system has adjusted the distribution of its resources in recognition of potential advances evolving from biotechnology and information technology. Similar progress is not apparent in extension.

Federal extension has also dramatically de-emphasized its direct education role in the past 20 years. Federal extension specialists are viewed today more as program leaders, coordinators, and facilitators rather than as educators engaged in staff training and conduct of educational programs. This change in the role of Federal extension is not viewed as having been beneficial to the overall national extension education program, which is left to cope with a lack of progress in national planning and needs assessment and a deterioration in the quality of educational service to the States.

The biotechnology era presents some very important challenges to the extension community. With renewed emphasis on basic agricultural research in the land grant universities, extension may become more involved in demonstration research to evaluate the technologies and products flowing out of the private sector. Without such evaluations individual farmers can incur exceedingly high costs (in terms of the costs of wrong decisions) of experimenting to determine which combinations are most profitable for them to use in production. Extensive staff training and development will be required at both the State specialists and county levels for extension to play an effective role in product testing and evaluation and in technology transfer during the biotechnology era.

SUMMARY OF IMPLICATIONS FOR 1985 FARM BILL

In summary, the OTA study identified five major implications for research and extension policy for the 1985 Farm Bill. These include:

Granting of property rights and exclusive licensing of technological discoveries have brought the unique nature of "social contract" of land grant universities into question. These new rules may change the distribution of benefits from land grant research discoveries. These changes warrant direct public discussion and consideration by policymakers.

Progress of the agricultural research community in establishing priorities is more advanced than that of extension.

The agricultural research system has adjusted the allocation of resources in recognition of potential advances evolving from biotechnology and information technology. Similar progress is not apparent in extension.

There is need for the Joint Council and others to address the following extension issues: clientele and mission of extension, organizational structure of the extension system, role of Federal extension service, and need for extension to conduct applied demonstration research.

Research and extension policy is a critical component of agricultural structure policy, but it must be integrated into other targeted policy tools to achieve structural goals. For moderate-size farms to be able to compete, for example, ways must be developed for making new technologies more available to them and for providing training in the use of these technologies.

STATEMENT OF DR. JAMES W. RICHARDSON, AGRICULTURAL AND FOOD POLICY CENTER, DEPARTMENT OF AGRICULTURAL ECONOMICS, TEXAS A&M UNIVERSITY, TEXAS AGRICULTURAL EXPERIMENT STATION

Mr. Chairman and Members of the Committee: My testimony summarizes the results of research conducted by a workgroup for the Office of Technology Assessment (OTA) study on technology, public policy, and the changing structure of American agriculture. The workgroup evaluated the effects of alternative agricultural policies on the growth and survival of different size farms in selected regions of the country. Different size Texas cotton farms, Southern Great Plains wheat farms, Mississippi Delta cotton/rice farms, Illinois corn/soybean farms, and Nebraska corn/soybean/sorghum farms were evaluated. Different size dairy farms in Minnesota, the Southwest, and the Southeast were also evaluated. In all regions, the largest farm was defined to represent the largest 10 percent of the farms, with the next largest farm representative of farms in the next 20 percentile. The smallest farm defined for each region represented farms in the next smaller 30 percentile, generally the typical moderate size farm in each region. We did not attempt to evaluate the chances of survival for small predominantly part time farms.

Operators on the representative crop farms were assumed to own a portion of the cropland farmed and lease the remaining acreage on a cropshare or cash lease basis. The initial debt to asset position for the representative farms was developed from survey information provided by the U.S. Department of Agriculture.

All of the representative farms were analyzed over a 10 year planning horizon using a procedure which incorporated both price and yield risk and assumed the commodity yield estimates in the OTA study from emerging technologies. Significant economies of size were identified for large scale dairy farms and incorporated into the analysis. Very large crop and dairy farms were assumed to adopt new technology sooner than smaller farms, thus reducing their per unit production costs relative to moderate size farms. In addition, economies of size for large and very large farms reported by other researchers were incorporated in the representative farms.

AGRICULTURAL POLICIES

Crop farms

Removing target prices and deficiency payments (income supports) substantially reduced average annual net farm income for all farms analyzed. In many cases, average annual net farm income declined from a positive value under the current farm bill to a negative number in the absence of deficiency payments. When effective, the $50,000 payment limitation causes deficiency payments to benefit moderate size farms more than very large farms. Average annual growth rates for all farms were reduced by removing the deficiency payment. The rate of growth for the moderate size farms was reduced considerably more than for the very large farms. Average annual net farm income for moderate size farms was reduced more than for large and very large farms.

Removing both price and income supports (loan rates and target prices) from the current farm program reduced average annual net farm incomes for all three farm sizes in all regions. Increased price variability coupled with no income supports reduced the chances of survival for moderate size wheat and cotton farms more than for very large cotton and wheat farms. Annual growth rates for all farms were reduced relative to the current farm program. The large and very large farms suffered more from the loss of price supports than the moderate size farm. In contrast, the moderate size farm was more adversely affected by a loss in deficiency payments than were large and very large farms.

Targeting farm program benefits to farms producing less than $300,000 of farm program crops reduced average annual net farm income and ending farm size for the very large farms while leaving the moderate size farm largely unaffected. Farms producing in excess of the $300,000 limit did not experience major reductions in their probability of survival because they are not as dependent on income supports as the moderate size farms. Although probabilities of survival for the large farms are largely unaffected, their average growth rates were reduced as much as 50 percent from the growth rates under the current farm program. Very large farms gain indirect benefits from reduced price variability and as a result, targeting program benefits to smaller farms does not reduce the large farms' net income and growth rate as much as removing both price and income supports.

Eliminating all farm program provisions reduced the probability of survival for the cotton and wheat farms, relative to the current farm program. Probability of survival fell about 50 percent for the moderate size farms while this probability declined only 17 percent for the very large farms. The probability of survival for farms in other regions was not greatly affected by this policy change. Average annual net farm incomes were reduced $10,000 to $120,000 depending on farm size and crop(s) produced. Annual net farm income for the moderate size Illinois grain farm declined 58 percent more than for the very large Illinois grain farm. Average ending net worth for all farms declined due to reductions in land values following the loss of all farms program benefits. All three sizes of farms continued to grow in the absence of farm programs, but at substantially slower annual rates than under the current farm program.

Dairy farms

Reducing the milk support price 50 cents/cwt. adversely affected all dairy farms. Average annual net farm income and ending net worth were reduced relative to the current dairy program. The largest dairies in each region experienced no reduction in the probability of survival. The 52 cow dairy in Minnesota was the most adversely affected as its probability of survival fell by almost 50 percent.

Removing the dairy support program resulted in substantially lower probabilities of survival for the moderate and large dairies while leaving the very large dairies largely unaffected. Average annual net farm incomes fall more for the moderate size dairies than for the very large dairies. The very large dairies in the Southwest and Southeast were able to generate net farm incomes in excess of $100,000/year without the support program.

An effective supply control program which reduced milk supplies about 5 percent would increase the probability of survival for moderate size dairies in Minnesota about 30 percent. Large and very large farms in all three regions benefit more than moderate size farms in terms of increased ending net worth and annual net farm incomes as a result of such a program. The Minnesota dairies had a $15,000 increase in net farm income while the largest Southwest dairy had over a $400,000 increase in net farm income.

FINANCIAL BAILOUT PROGRAMS

The crop and dairy farms were also analyzed assuming they were highly leveraged and two alternative debt bailout programs were available. Debt restructure and interest subsidy programs were evaluated for the representative farms. Very large farms in all regions were found to be less dependent on a bailout program than smaller farms for their continued survival and success.

Restructuring initial debt for highly leveraged farms failed to appreciably increase the probability of survival for any farm other than for the moderate and large wheat farms. Debt restructuring increased the average number of years the farms remained in business, even if they ultimately were forced into insolvency. Very large farms benefited more than moderate size farms from debt restructure because of their lower per unit production costs.

Providing an interest rate subsidy of 4 to 5 percentage points to all highly leveraged farms provided a greater benefit than restructuring the farm operators debt. Probability of survival and average net farm income were increased more by the interest rate subsidy program. Very large farms benefited more from the interest rate subsidy than moderate size farms. Very large farms also experienced more rapid growth rates and greater average annual net farm incomes than moderate size farms.

IMPLICATIONS FOR THE 1985 FARM BILL

Crop farms

The results of the OTA study demonstrate that farm programs have major impacts on rates of growth in farm size, real wealth, net farm income, and farm survival. In addition, moderate size farms are more dependent on farm programs for their continued survival and success than are very large farms.

More specifically, income supports provide greater benefits to moderate size farms than very large farms, when the $50,000 payment limitation is effective. Very large farms are better able to survive and grow without income supports.

Removing all farm program benefits would reduce the probability of survival more for moderate size farms than for large and very large farms. Targeting farm program benefits such as price and income supports to moderate size farms may be an effective alternative for prolonging the survival moderate size farms. Such a farm policy provides an indirect price stabilization program (safety net) for very large farms. Prices for all farms are stabilized by moderate size farms participating in the loan program.

Dairy farms

Agricultural policies which favor the dairy industry provide greater financial opportunities for large rather than small dairies. Small dairies are more adversely affeacted than large dairies by farm policies that reduce or eliminate support prices. Efficiency is the primary reason for large scale dairies being less dependent on dairy policies for their continued economic success.

Traditional dairy regions will likely face continued competitive pressure from large scale, more efficient producers in other regions. Dairy policies must be sufficiently flexible to permit the needed restructuring of dairies in the Lake States and Northeast, while encouraging adoption of new technology. A milk price support tied to the cost of production for efficient producers would achieve these two objectives.

STATEMENT OF DR. CLIVE W. DONOHO, JR., DIRECTOR, GEORGIA AGRICULTURAL EXPERIMENT STATIONS, AND ASSOCIATE DEAN, COLLEGE OF AGRICULTURE, UNIVERSITY OF GEORGIA

My name is Clive W. Donoho, Jr. I am Director of the Georgia Agricultural Experiment Stations and Associate Dean of the College of Agriculture at the University of Georgia. Prior to November 26, 1984, I was Director of the Ohio Agricultural Research and Development Center at the Ohio State University.

State Agricultural Experiment Stations have been involved in technology development for agriculture for over 100 years. This national research effort coupled with the partnership efforts of ARS/USDA and private industry have provided the technological base that has allowed this nation to assume a world leadership role in agriculture.

Research and technology development have many implications on policy development for agriculture. Some have suggested that research is a major cause of present-day surpluses and over production. While new technology development may well have provided the agricultural production system to allow this to happen, the reasons for these problems are far more policy oriented than technology oriented. Example: U.S. fiscal and monetary policies, foreign trade barriers, U.S. import policies, past grain embargoes, and past farm programs are having a tremendous impact on the availability of foreign markets for U.S. products. The national deficit and the deficit's impact on interest rates and the value of the U.S. dollar are crippling farm profitability and this country's ability to sell its products abroad.

A substantial reduction in technology development for agriculture would have a devastating effect on the competitiveness of the American farmer and U.S. agriculture. Fact: No segment of the U.S. economy can rest on the technology of yesterday and expect to compete successfully. The need for new technology development in agriculture has never been greater. The stake is nothing less than the U.S.' competitive edge in the world agricultural economy.

FUTURE RESEARCH EMPHASIS BY THE STATE AGRICULTURAL EXPERIMENT STATIONS

The research emphasis by the State Agricultural Experiment Stations will continue to be a broad based research effort aimed at developing new technologies and policies for the production, harvesting, storage, processing, distribution and consumption of agricultural products (food and fiber). Research thrusts will concentrate in the following broad general areas over the next decade.

I. Expand basic science and biotechnology for plant and animal agriculture, including forestry. Food technology, the beneficial utilization of waste products, and the detoxification of environmental contaminants and other related areas will also be included.

II. Development of advanced integrated technology systems for food and fiber production and related post-harvest technology, including integrated pest management, integrated reproductive management of animals, natural resource conservation, energy and food animal health.

III. Research on conservation, preservation and effective utilization of soil, water and other natural resources, including the monitoring and protection of air, rain, and ground water quality.

IV. Strengthen research efforts on energy systems, energy conservation and energy alternatives for crop production, post-harvest handling and processing of food products.

V. Research on marketing, utilization and policy to increase the sale of agricultural products in both domestic and foreign markets.

VI. Research to improve human nutrition, fresh and processed food safety and quality, and family and community management.

The emerging technologies from this research effort will impact agricultural productivity. Biotechnology and the development of new integrated technology systems will increase efficiency of production, total yield of crop and animal agriculture, and improve the quality (nutrition and consumer satisfaction) of agricultural products.

BIOLOGICAL RESEARCH EFFECTS

Molecular Farming—In addition to the traditional food and fiber production systems, biotechnology research could open the door for farms to become involved in molecular farming. Molecular farming would involve animal and plants producing new high value products. Genetic engineering and gene splicing may well provide the means of changing animal and plants to produce high valuable pharmaceutical and industrial products that are extremely costly to produce by present chemical means.

Increased Productivity—Growth hormones in animals, plant regulators for crops, disease and insect resistance in plants and animals will be new technology that will have significant impact on productivity of U.S. agriculture over the next 10–20 year period. Genetic modification through biotechnology coupled with traditional breeding technologies will result in a whole array of new plant and animal types used for agricultural production. The rate of growth for U.S. agriculture arising from this increased productivity should average between 1.5 and 2.5 percent per year for plant agriculture and .5 to 1.5 percent per year for animal agriculture.

MECHANIZATION AND ROBOTIC EFFECTS

While much of agriculture research and technology development is size neutral when utilized by U.S. farmers, mechanization advances are often associated with the economy expansion and development of domestic and foreign markets for agricultural products will be a major issue for the State Agricultural Experiment Stations and the Land Grant Universities. Research on computer systems to control production processes in agriculture and to assist in management decisions for agriculture will be expanded and continued in the years ahead. Modern computer technology and telecommunications offer great potential for increasing agricultural productivity by improving efficiency of information exchange between and among scientists, extension specialists, farmers, and even consumers.

SUMMARY STATEMENT

Our national agricultural economy is undergoing an unparalleled series of economic shocks and structural changes. There are many reasons for this and the internationalization of agriculture has brought into play new factors that influence agricultural supply, demand, prices and income. Increased foreign competition has become an important factor, especially when coupled with the present value of the U.S. dollar. While many factors impact the present situation and agriculture, the need for continued technology development is not lessened by the present situation of surpluses and oversupply, but the need for U.S. agriculture to compete would indicate that we must continue to invest heavily in agricultural research in the years ahead. The present proposed budget reductions to the State Agricultural Experiment Stations contained in the Executive Budget would significantly reduce the development of this technology and it would have a significant impact upon the costs for agricultural production and the efficiency for producing agricultural products.

Agricultural research will sustain and improve productivity growth. Improved productivity of off-farm inputs, labor, and natural resources inputs is the key to a profitable and competitive agriculture and absolutely vital to having a healthy agricultural industry in this nation. It must be remembered that research is a long term commitment and that the new technology that will be introduced in the next 2-3 year period were research ideas generated by scientists 10-15 years ago. Likewise, the new ideas coming out of agricultural laboratories and field research today will impact agriculture 10-15 years from now.

It should also be remembered that while new technology impacts the agricultural policy needed for this country, national policies in turn greatly impact the research system and the ability of this nation to effectively utilize the benefits from the new technology development.

STATEMENT OF DR. GEOFFREY A. BENSON, EXTENSION ECONOMIST, DAIRY MANAGEMENT AND MARKETING, NORTH CAROLINA STATE UNIVERSITY AT RALEIGH

Mr. Chairman, Members of the Committee, Ladies and Gentlemen, my name is Geoffrey Benson, and I am Extension Economist, Dairy Management and Marketing at North Carolina State University at Raleigh. I will comment on some of the long term forces at work in dairy farming, including technology and research, and some implications for dairy policy.

The current milk surplus has been extensively debated and the U.S. Congress has enacted several pieces of legislation during the past four years in attempting to control the federal outlays under the dairy price support program. The 1983 Dairy and Tobacco Adjustment Act included a price support cut, a voluntary paid diversion program, an assessment on dairy farmers to help defray program costs, and a national promotion program funded by mandatory contributions from dairy farmers. Although milk production declined 2.8 percent from 1983 to 1984 the indications are that the productive capacity of the nation's dairy farmers continues to exceed the commercial demand for dairy products, in other words there are too many cows and too many dairy farms. As we approach the debate on the 1985 farm bill it is appropriate perhaps to reflect on some of the underlying characteristics of dairy farming in the United States.

Raw milk is highly perishable and must be cooled, moved and processed quickly. The high water content of raw and pasteurized fluid milk and the need for refrigeration means that transportation costs are high. Milk production is a continuous biological process and is unresponsive to price changes in the short run. It takes approximately 27 months to raise a dairy animal from birth to entry into the herd as milking animal thus expansion in cow numbers is a long-term process. Once in the herd a cow has an average productive life of three or four lactations. Each lactation lasts 10 or 11 months with a two month rest period between lactations. During each lactation period the daily milk production first rises, peaks then declines. Although production during lactation can be reduced by reduced levels of feeding the most profitable method for cutting production is to sell the least productive cows for slaughter, an irreversible process. However, dairy farming requires a large investment in specialized facilities and equipment, and usually it is not profitable to operate the farm at significantly below capacity. Thus a permanent reduction in milk supply involves a reduction in both the number of farms and in the number of cows. The implication is that milk production adjusts slowly to changes in prices, in large part because of the nature of the biology of milk production. Furthermore, the demand for dairy products is only slightly responsive (inelastic) to price changes thus, in the absence of the price support program small changes in production would cause marked changes in prices.

Notable changes have occurred in productivity and in the structure of U.S. dairy farming, Tables 1 and 2.

Production per cow increased from 5,842 lb. in 1955 to 12,531 lb. in 1983.

Dairy labor efficiency increased from 51 lb. of milk produced per hour in 1955 to 418 lb. in 1982.

The national dairy herd decreased from 21 million cows in 1955 to 11 million in 1983.

The number of dairy farms with 10 or more cows declined from 422,000 in 1964 to 186,000 in 1982.

There is no clear long term trend in total milk production, at least through the late 1970's, as declining number of cows tended to offset increases in production per cow. Total production varied between 123 and 127 bil. lb. from 1955 to 1964, tended to decline after 1964 and reached 115 bil. lb. in 1975. Total production increased modestly in 1976-8 and a marked expansion began in 1979 when cow numbers increased after a long period of decline. The rate of decline in dairy farm numbers also slowed dramatically during the 1978-82 period, as the attached figure illustrates. These increases in production were not matched by increasing commercial sales and as a result a large surplus was created. Total commercial disappearance (sales) does not show a consistent long term trend. Modest increases occurred from 1955 through 1965, declined from 1966 through 1969 and have increased slowly since 1969, Table 1. A long run trend of lower per capita dairy product sales ended in 1976 and gains have occurred since then, Table 3. Increases in total population, higher per capita incomes and declining relative prices for dairy products have been positive factors in commercial demand. Because raw milk prices are supported by the dairy program supply-demand imbalances are reflected initially in CCC purchases rather than prices. Here again, there does not appear to be any long term trend and recent purchases as a percentage of production are similar to those of the early 1960's, Table 1.

The long run changes in U.S. dairy farming are not unique of course, but have occurred throughout agriculture. Many factors affect industry structure including production related factors, consumer demand factors and government policy. Consumer demand factors such as preferences, population, income, and the availability and price of substitutes affect the quantities demanded at different product prices. Costs of production relative to product prices, risk, the attractiveness of one commodity relative to other opportunities on and off the farm, and technical change affect the supply of commodities. Government policies and programs may affect price and income levels, and price and income related risk.

Research has shown that technical change which is to say the development of new knowledge through research and the application and adoption of this new knowledge in the production process, has had a major impact on agriculture. Technical change includes new or improved products, processes, knowledge and skills. Major changes have occurred in the type, quality or prices of the various production inputs used in dairying including machinery and equipment, seeds, chemicals, feed and fertilizers.

The productivity of dairy cows has increased through genetic selection of sires and the widespread adoption of artificial insemination which permits superior sires to be used to breed thousands of cows annually. Genetic progress is expected to continue, and may accelerate with the introduction of embryo transfer technology which permits several embryos from superior cows to be transferred to recipient animals where the fetus develops normally. Changes in nutrition, herd health and herd management practices have occurred to permit the achievement of improvements in genetic potential. Research in the new field of biotechnology is likely to generate continued improvements in productivity in agriculture in general, including milk production. For example current research with bovine growth hormone is likely to lead to significant increases in milk production. Past increases in production per cow have exceeded any growth in commercial demand and this trend is likely to continue.

Changes in milking facilities and equipment, housing, feed production and feeding, and manure handling have lead to the substitution of mechanization for labor. These changes have permitted family labor to handle more cows and much of the new technology required a larger scale of operation to be economically feasible. As noted above, the consequences of the increased productivity of cows and labor has been reflected in fewer cows and fewer farms rather than increased production and increased sales.

A technically feasible innovation is adopted if producers expect it to be more profitable than the existing state of the art. The new technology might lead to a higher quality product, lower costs of production, greater output, or a combination of these. If an innovation is profitable, producers have an incentive to adopt it and total production is likely to increase. This is true even when an innovation does not lead to higher production per cow or per acre, and does not require a larger scale of operation to be feasible, simply because increased profitability is likely to attract other producers or will induce expansion of the more profitable enterprise at the expense of other, less profitable ones. However, increases in supply cause a reduction in the price of the commodity in the absence of government intervention. These price reductions at the farm level are reflected in retail prices, in general, and explain in part the declining percentage of income spent on food, Table 3.

Consumers respond to lower retail prices by buying more of the cheaper commodity, both because it is a better buy relative to competing items and because lower real prices are equivalent to an increase in income. Thus, technical change in one commodity has repercussions on other agricultural commodities and non-agricultural industries. The effect of new technology on producers varies. The early adopters are likely to benefit most because initially they obtain the financial benefits before the commodity price is seriously affected. The laggards continue to bear the higher costs of outdated technology after the commodity price has been affected. It has been argued that technical change is a major cause of the observed change in farm structure to fewer, larger farms. Professor Barkley of Washington State University neatly summarized the effects of technical change. "Society captures the benefits of economics of scale in agriculture and the farmer remains on the technology treadmill."

The effect on the U.S. dairy industry of the federal price support program and federal and state milk marketing orders has been extensively debated. In the short run the price support program has raised producer prices and incomes. The longer term effects are less clear. It has been argued by some that the program reduces price risk and therefore, has increased the rate of investment and the rate of adoption of new technology, leading to lower production costs and lower prices. Others have agrued that prices have been higher and that changes in farm structure have been reduced. What is clear however, is that there have been marked changes both in milk production technology and in the structure of the dairy industry.

The current supply-demand imbalance has several causes including price support levels in the 1977 farm bill that made dairying attractive relative to on- and off-farm alternatives. Dairying was sufficiently attractive that new investments were made in specialized dairy facilities, additional dairy heifers were raised, and few dairymen left the industy. Policy measures since 1981 have failed to bring production and sales into a politically acceptable balance in part because the alternatives to dairying remain unattractive and the salvage value of dairy cows and other specialized dairy assets also are unattractive.

The short term dairy policy options include support price changes, cost sharing, demand enhancement, voluntary or mandatory production controls, and phasing out the program. A lower support price will lead to lower production, after a lag, through a reduction in the number of cows and in the number of dairy farms. Cost sharing has the same effect on producers as a price cut and is unpopular with dairymen. Cost sharing does nothing to encourage sales however, it has an immediate effect on federal outlays. Continuation of the national promotion efforts should reduce the size of the surplus but is unlikley to permanently bring demand in line with production and some production adjustments will be necessary. Voluntary production controls such as the milk diversion program are costly and not very effective. The possible exception is a whole farm retirement program which could induce a rapid and probably permanent reduction in the number of cows and in the number of farms. Mandatory production controls are difficult to implement fairly and reduce producers net incomes initially. In the long term there are some very undesirable economic consequences as industry adjustments are restricted and because benefits become capitalized. Removal of price supports at the present time would lead to sharp declines in milk prices in the short term and more variable prices over the long term.

If the price support program continues then the emphasis is likely to shift toward price stability and away from price and income support. In this case and if a repeat of the current problems is to be avoided, the policy options include supply-demand sensitive pricing mechaniams that would respond both to long term changes in the industry and to short term factors affecting supply and demand. However, changes in the pricing mechanisms will not solve the current problems.

In summary, major changes have occurred in U.S. dairy farming including sustained increases in production per cow, the substitution of capital investments in machinery, equipment and facilities for labor, decreases in the number of cows and in the number of dairy farms, and increasing herd size. Technical change has been a major factor behind past changes and this is expected to continue. Events in the late 1970's lead to an expansion in milk production and an unacceptable surplus. Short term policy measures to control federal outlays under the price support program will cause a decrease in the number of cows and in the number of dairy farms. If the dairy price support program continues then the longer term issues include pricing mechanisms that will prevent a reoccurrence of the current problems and that are consistent with the longer term changes in the dairy industry including technical change.

INDICES OF MILK PRODUCTION, NUMBER OF COWS, MILK PER COW, AND NUMBER OF DAIRY FARMS WITH 10 OR MORE COWS, 1964 TO 1984, (1969 = 100).

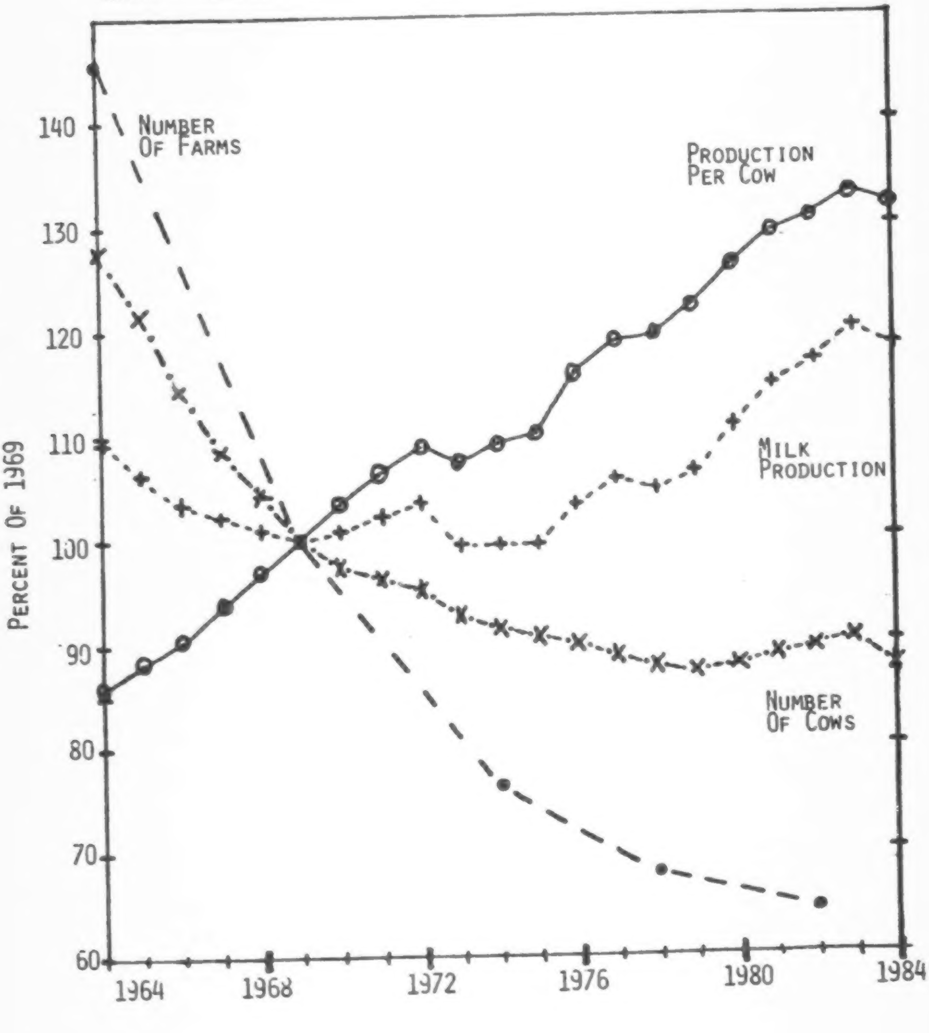

Table 1. Milk Production, Commercial Disappearance and USDA Removals, 1955-84

Year	Number of Dairy Cows	Production Per Cow	Total Milk Production	Commercial Disappearance	USDA Removals Percentage of Marketings[1]	
					Milk -Fat	Solids not fat
1955	21,044	5,842	122.9	111.5	4.7	7.5
1960	17,515	7,029	123.1	114.3	3.0	8.6
1961	17,243	7,290	125.7	112.7	9.5	13.3
1962	16,842	7,496	126.3	112.9	7.5	13.2
1963	16,260	7,700	125.2	113.0	6.4	11.9
1964	15,677	8,099	127.0	114.4	6.9	12.2
1965	14,953	8,305	124.2	115.1	2.6	8.7
1966	14,071	8,522	119.9	115.6	2.5	4.4
1967	13,415	8,851	118.7	110.3	6.2	7.0
1968	12,832	9,135	117.2	109.6	4.4	6.0
1969	12,307	9,434	116.1	108.7	4.1	3.9
1970	12,000	9,751	117.0	108.9	6.6	4.9
1971	11,839	10,015	118.6	109.4	5.9	5.0
1972	11,700	10,259	120.0	111.8	4.5	2.8
1973	11,413	10,119	115.5	111.9	0.7	0.6
1974	11,230	10,293	115.6	113.1	2.2	4.3
1975	11,139	10,360	115.4	113.8	0.9	2.9
1976	11,032	10,894	120.2	116.3	2.9	2.1
1977	10,945	11,206	122.7	116.1	2.9	3.4
1978	10,803	11,243	121.5	118.8	1.0	2.0
1979	10,743	11,488	123.4	120.2	6.6	6.3
1980	10,810	11,889	128.5	119.2	9.9	8.3
1981	10,919	12,177	133.0	120.5	10.5	9.7
1982	11,026	12,316	135.8	122.4	12.1	10.3
1983	11,098	12,585	139.7	122.8	7.5	7.7
1984	10,840	12,495	135.4	125.9	-	-

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[1] Marketing Year basis, beginning April 1 for 1955-77, October 1 for 1977 to present.

Source: Dairy Outlook and Situation Report, various issues, U. S. Department of Agriculture, Economic Research Service

Table 2. Number of dairy farms, dairy cows and production per cow, with rates of change, selected years 1964-82

Year	Farms with 10 or More Dairy Cows	Average Annual Change from Previous Period	Dairy Cows	Average Annual Change from Previous Period	Production Per Cow	Average Annual Change from Previous Period
		%	thou.	%	lb.	%
1964	422,032	-	15,677	-	8,099	-
1969	289,849	-6.3	12,307	-4.3	9,434	+3.3
1974	221,462	-4.7	11,230	-1.8	10,293	+1.8
1978	196,507	-2.8	10,803	-1.0	11,243	+2.3
1982	186,071	-1.3	11,026	+0.5	12,316	+2.4

Sources: Census of Agriculture, U. S. Department of Commerce and Dairy Situation and Outlook, U. S. Department of Agriculture.

Table 3. Selected Consumption Statistics, 1965-83

Year	Per Capita Civilian Disappearance	Consumer Price Index		Percentage of Disposable Income Spent	
		All Items	Dairy Products	For all Food	For Dairy Products
	lb. Milk Equiv.	1967 = 100		%	%
1965	620	94.5	90.0	18.0	2.7
1970	561	116.3	118.8	17.2	2.4
1975	540	161.2	156.6	16.9	2.1
1976	540	170.5	169.3	16.8	2.2
1977	542	181.5	173.9	16.5	2.1
1978	545	195.4	185.6	16.3	2.0
1979	548	217.4	207.1	16.5	2.0
1980	544	246.8	227.4	16.5	2.1
1981	543	272.4	243.6	15.9	2.0
1982	561	289.1	247.0	15.8	2.0
1983	578	298.4	250.0	15.6	2.0

Source: Dairy Outlook and Situation, U. S. Department of Agriculture, Economic Research Service, September 1984.

Statement of Dr L.F. Huggins [1]

UNDERLYING PHILOSOPHY

First, I want to commend this Committee and the Administration on the basic approach being taken in developing a new agricultural policy. The basic goals of an economically sound, long-range strategy for production, processing and delivery of the nation's food and fiber are sound and represent the appropriate approach. The strategies you ultimately incorporate need to provide an opportunity for a profitable farming foundation while recognizing that producing high quality, reasonably priced food and fiber is critical to every citizen, not just our nation's farmers. Thus, your new legislation should establish agricultural policy based upon a broadened perspective of all industries involved in the processing and delivery of food and wood-based products instead of only the farming segment that is its foundation.

An underlying premise of your new agricultural legislation should be to encourage farming and the other industries associated with food and fiber production to retain or develop positions of international competitive leadership. An understanding of the potential opportunities that new technologies and research promise is critically important to developing sound, far-sighted legislation.

WHAT TECHNOLOGIES OFFER THE GREATEST PROSPECTS

Agriculture encompasses such a diverse and fundamental range of industries that it is wrong to claim any single technology or future development will revolutionize the field. Even ranking areas in order of their future importance is not easy. Nevertheless, three areas of technology and research are clearly of such pervasive scope and offer such fundamentally new opportunities to merit being at the top of any such list. These three areas are: (1) computer and computer-compatible sensors, (2) biotechnology and biochemical processing, and (3) artificial intelligence applied to agricultural production and management. It is not the individual developments in each of these exciting fields, but their synergistic integration into our complex agricultural infrastructure that offers unique U.S. competitive advantages.

HOW CAN THESE TECHNOLOGIES FAVORABLY IMPACT AGRICULTURE

The primary need of agriculture today is to improve the profit opportunity of its farming segment. To achieve such a goal in an economically sound way which contributes to the entire population's standard of living requires concerted efforts to reduce production costs, to improve product quality and to develop new uses for our basic commodities. These are exactly the means by which agriculturally focused research in the three listed technologies offers improved profitability margins.

Computers.—The primary benefit of computers to agriculture is not in the bookkeeping systems that are the natural. first applications of today's personal computers operating on our farms. Rather, the major future impacts involve the integration, of micro-processors and new electronic sensors as intelligent, sophisticated controllers in fundamentally new, more capable machines and monitoring systems. Such systems will lower production costs by making feasible more individualized, adaptive production of plants and animals. This personalized adaptability will not only enhance production efficiency, but will simultaneously improve product quality and consistency.

Sophisticated monitoring and control of production agriculture will lower costs in numerous ways. For example, better monitoring will enable lower temperature, more energy efficient grain drying techniques which will simultaneously produce a higher quality product. Much more selective application of herbicides and pesticides made possible by vision-controlled systems will reduce chemical costs and also result in reduced environmental concerns. Completely automated record keeping will reduce financial risk by providing early disease and pest detection and by offering information-based decision support systems.

Biotechnology/Biotechnology Processing.—Congress has provided FY85 competitive research funding for developing the science of genetic manipulation of molecular substances. The potential of this science is being addressed by others at this hearing. However, it should be pointed out that, in order for major benefits of such new science to be made operational on a field scale, much production engineering will be required. As with so many of today's sophisticated technologies, an integrated approach is required to achieve practicality.

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[1] Head, Agricultural Engineering Department, Purdue University, W. Lafayette, IN. The views expressed are those of the author and do not necessarily reflect those of Purdue University.

Much of the opportunity for future profitability involves valued-added post-harvest processing or conditioning. These opportunities will often yield improved product quality or involve the use of farm-produced biomass as the raw material of choice for new products.

In addition to improved plant and animal species promised from genetic manipulation, our expanding knowledge of the fundamentals of biological systems is creating biosystems to process biomass into high-value products. Current examples include: sweeteners from corn (U.S. consumption is 50 lbs. per capita); ethanol from corn for use as a non-leaded octane booster; and vegetable oils for non-food uses including coatings, lubricants and plasticizers.

High-valued products such as oilseed cake and meal, animal and vegetable oils, prepared meats and related items constituted a $120 billion world market in 1980. This market is expected to more than double by 1990. Much of the growth in this market is going to U.S. competitors while we concentrate on bulk exports. However, a $15 billion expansion of such high-valued exports would provide an estimated one million more U.S. jobs.

Artificial Intelligence. This term covers a broad set of sub-fields relevant to the spectrum of agricultural industries. However, it is the element which will determine the real degree of sucess of the other fields because it will provide the "operational knowledge" which enable implementation.

Primary applications fall into two categories: (1) technologies which will enable the creation of entirely new machines and mechanisms for the production and processing of food, e.g. visual image processing and pattern recognition; and (2) the application of knowledge-based decision support systems to create management enhancement tools. Thus, research in these areas must proceed in phase with microprocessor and sensor technologies to enable these devices to attain their real potential.

CONCLUSIONS

Meeting the challenge of maintaining the world's leading agricultural production, processing and delivery system will require a complex set of inputs. We must have sound and farsighted governmental policies which stimulate our agricultural industries to maintain a competitive edge. We have the infrastructure to advantageously utilize the most sophisticated science and engineering advances which are on our horizon. The challenge is to stimulate the continued development of these new technologies and to encourage their adoption on an economically sound schedule. For this to occur, a long-range perspective with clear goals is essential.

MARCH 20 HEARING—CAPITAL INVESTMENT, DEBT, CREDIT, AND TAXES

[The following material was submitted by Senator Zorinsky:]

U.S. Department of Agriculture,
Farmers Home Administration,
Washington, D.C., March 14, 1985.

Subject: Status Report on Debt Restructuring.
To: The Acting Associate Administrator.

Attached are the results of a telephone survey made of State Offices March 14, 1985, on the status of the debt restructuring program. The following questions were asked (the numbers on the accompanying charts correspond to the question numbers):

1. Number of borrowers requesting set aside?
2. Number of borrowers rescheduled/reamortized without set aside?
3. Number of borrowers granted set aside?
4. Total number of borrowers rejected for set aside?
5. Contracts signed by:
a. Credit analysis?
b. Farm management specialists?
c. Approved Lender Program?
6. Guarantees:
a. Number of borrowers under review?
b. Number approved?
c. Dollar value of loans approved?

The state by state results follow on the attached chart:

Subject: Caution on Debt Restructuring Status Report.
To: Users of This Report.

Question number 4 on this report, "Total number of borrowers rejected for set aside" can be extremely misleading.

The number "rejected" includes many borrowers who have been helped by the Debt Adjustment Program. There may be borrowers whose loans have been reviewed under the program and have received a limited resource rate, had their loans reamortized, were helped through adjustments by other lenders or a combination of these methods. Even though many of them have received this help, they are listed as "rejected" for set aside.

Question 4 may be confusing in this sense. It could be interpreted as meaning those borrowers received no help from FmHA. This would be in error.

State	Req SA question 1	Resc/ reamt. question 2	Got SA question 3	No SA question 4	Contracts question 5			Guarnts question 6	
					a	b.	c	a.	b
Alabama	2,016	358	95	849	0	0	0	10	2
Alaska	4	0	0	0	0	0	0	0	0
Arizona	273	23	1	46	0	0	0	1	1
Arkansas	4,482	408	65	958	0	0	0	1	0
California	1,276	196	40	201	0	0	0	9	0
Colorado	900	256	37	222	6	8	0	0	0
Connecticut/Massachusetts/Rhode Island	316	109	48	102	1	0	0	0	0
Delaware/Maryland	189	112	15	148	8	8	0	1	0
Florida	975	308	76	131	9	0	0	5	4
Georgia	2,218	355	21	697	0	0	0	4	1
Hawaii	144	36	0	0	0	0	0	0	0
Idaho	1,492	226	68	500	0	0	0	0	0
Illinois	5,355	729	397	1,115	31	24	0	10	2
Indiana	2,524	80	35	347	0	1	0	0	0
Iowa	7,157	593	628	882	27	36	3	27	12
Kansas	2,672	421	76	679	13	12	6	23	4
Kentucky	3,336	331	170	356	13	10	0	13	0
Louisiana	3,263	930	237	951	0	0	0	0	0
Maine	862	189	158	255	0	0	0	0	0
Michigan	2,614	209	231	364	0	0	0	0	0
Minnesota	4,562	406	276	927	30	24	3	42	3
Mississippi	3,955	413	30	769	0	0	0	122	6
Missouri	6,335	1,117	615	2,264	11	7	0	22	4
Montana	1,737	131	172	252	1	6	0	5	1
Nebraska	4,410	400	105	680	15	12	2	13	1
Nevada	106	15	0	68	0	0	0	0	0
New Hampshire/Vermont	354	141	16	24	3	3	0	0	0
New Jersey	302	26	5	60	0	0	0	1	0
New Mexico	572	114	29	172	0	0	0	0	0
New York	2,117	221	119	167	2	2	0	0	0
North Carolina	2,320	304	59	213	3	0	0	6	0
North Dakota	4,232	747	385	699	16	5	0	15	2
Ohio	2,072	178	24	454	3	3	0	10	0
Oklahoma	4,124	993	313	1,138	25	5	0	4	0
Oregon	758	70	4	131	0	0	0	0	0
Pennsylvania	1,420	183	146	411	2	5	0	4	0
Puerto Rico	775	54	7	158	0	0	0	0	0
South Carolina	1,221	225	41	163	0	0	0	13	6
South Dakota	4,963	50	32	41	0	36	0	0	0
Tennessee	3,197	321	25	395	1	0	0	1	0
Texas	6,319	980	176	1,563	5	0	0	42	9
Utah	606	177	35	194	0	1	0	0	0
Virginia	1,848	758	149	567	0	1	0	1	1
Washington	889	121	49	202	0	0	0	0	0
West Virginia	824	128	22	198	0	1	0	0	0
Wisconsin	3,357	525	1,446	152	8	15	0	2	2
Wyoming	589	154	81	87	2	0	0	7	0
United States total	106,032	14,821	6,759	20,952	235	225	14	414	61

Total dollar value of guaranteed loans approved—$8,389,922.

Value of loans approved by State

1. Alabama	$146,500
2. Arizona	185,000
3. Florida	937,130
4. Georgia	125,000
5. Illinois	145,000
6. Iowa	1,161,170
7. Kansas	512,000
8. Minnesota	678,200
9. Mississippi	819,500
10. Missouri	456,320
11. Montana	133,642
12. Nebraska	95,190
13. North Dakota	180,670
14. South Carolina	1,084,700
15. Texas	735,900
16. Virginia	194,000
17. Wisconsin	800,000
Total	8,389,922

STATEMENT OF HON. MITCH MCCONNELL, A U.S. SENATOR FROM KENTUCKY

Of all the issues facing the Senate in establishing a new direction in farm policy, perhaps none is as important and timely as the issue of agricultural credit. When the current law which authorizes many current farm programs was enacted in 1933, most farmers had a "pay as you go" policy, or a handshake and a promise.

But times are different. Farm Debt has increased 4-fold in the last decade. Farm credit is Big Business. The band aid approaches of the past to farm credit problems are simply outdated and I'm hopeful that this testimony we hear today will provide us with the insights to formulate responsible farm credit policy.

The farm credit issue is not a Midwestern or a Southeastern issue. It's not a Republican or a Democratic issue. It's a people issue. Our farmers are the backbone of American agriculture and a sound, responsible approach to agricultural credit problems will go a long way towards reestablishing agriculture as America's number one industry. Thank you, Mr. Chairman.

STATEMENT OF MICHAEL D. BOEHLJE, ASSISTANT DEAN, COLLEGE OF AGRICULTURE, AND PROFESSOR OF ECONOMICS, IOWA STATE UNIVERSITY

INTRODUCTION

Many farmers are currently facing severe financial stress resulting in asset liquidations, problems in obtaining credit, and even bankruptcy. An important question in farm policy analysis is the applicability of traditional policy approaches to the problem of financial stress in agriculture and the appropriate farm policy in this financially stressful time. This is a particularly relevant question given that the 1983 PIK program was one of the most expensive and largest government transfer programs for agriculture in recent history, and yet many farmers are still facing severe financial problems.

FINANCIAL STRESS: EXISTENCE AND CAUSES

Existence

Melichar [January, 1984] was the first to document the financial condition of the agricultural sector; that data will not be repeated in detail here. A key dimension of this documentation is the distribution of debt (Table 1). This distribution indicated that in 1984 approximately 58 percent of the farms in the United States had leverage ratios of 10 percent or less, 24 percent had ratios from 11-40 percent, 11 percent had ratios of 41-70 percent and eight percent had leverage ratios in excess of 70 percent. This highly leveraged category (greater than 70 percent) controlled 31 percent of the debt and eight percent of the assets in U.S. agriculture. With current price, cost, and productivity relationships in agriculture, these highly leveraged farms are unable to make interest payments on their indebtedness, let alone repay any principal. In fact, Melichar's calculations suggest that farms with debt-to-asset ratios exceeding 30 percent will likely encounter some financial stress at current interest rates and rates of return on assets.

Survey data from individual Iowa farms corroborates Melichar's results and implications [Jolly, 1984]. Of the 1,231 farmers surveyed, 31 percent had no real estate or nonreal estate debt and exhibited debt-to-asset ratios averaging 1.8 percent; these farmers are not financially stressed by the current economic conditions in agriculture. In contrast, 40 percent of the farmers have both real estate and nonreal estate debt and a debt-to-asset ratio averaging 41.7 percent. Table 2 indicates the distribution of operators, assets, and liabilities for the Iowa sample by debt-to-asset category; the distributional results are very similar to those in Table 1 from Melichar's work. Size classification of the data (Table 3) suggests that financial stress problems are not unique to a particular size firm—firms of all sizes are encountering such stress.

More recent studies corroborate that the financial stress in agriculture is not unique to Iowa. A national survey in January, 1985, by *Farm Journal* and the Food and Agricultural Policy Research Institute indicates that nationwide, 15.4 percent of farmers have debt-to-asset ratios exceeding 70 percent, and 17.9 percent have debt-to-asset ratios of 40–70 percent; these farmers account for 30.8 percent and 34.9 percent of the debt respectively [Farm Journal, March 1985]. For the Central States, the data indicates a more severe problem; 21.0 percent of the farmers have debt-to-asset ratios exceeding 70 percent and 21.5 percent have ratios of 40–70 percent. Comparing these numbers to those obtained for Iowa in 1984 suggests that the financial conditions have deteriorated significantly in just one year.

A recently released USDA study also documents the nationwide characteristics of the problem [U.S.D.A., 1985]. That study estimated that as of January, 1985, 6.3 percent of family sized farms in the U.S. holding 9.3 percent of the debt are insolvent; 7.4 percent of the farms holding 11.1 percent of the debt have debt-to-asset ratios from 70–100 percent, and 20 percent of the farms holding 25.9 percent of the debt have a debt-to-asset ratios of 40–70 percent.

Financial management strategies and enhanced farm and off-farm income can be used to relieve the stress for many farms, but those with higher leverage ratios (for example, 70 percent or greater) will likely not be able to obtain sufficient relief from various financial and farm management strategies to stave off asset liquidation or default. In essence, at least 8–10 percent of U.S. farm assets must find a new owner in the next year or so, or the debt secured by those assets will not be serviced. Even those with debt-to-asset ratios of 40–70 percent will experience declining equity (even if land values stabilize) unless commodity prices rise, interest rates and other input prices fall, or productivity increases. In essence, the financial stress is significant for a subset of the farm population.

The financial stress problems faced by farmers have important implications beyond the farm gate. One of the first is the "shortfall" in interest and principal payments that the lenders will not receive this year. Doye and Jolly have estimated that nationwide $2.2 billion of scheduled interest payments and $6.2 billion of principal payments will not be made by farmers because they do not have the cash to service loan obligations [Doye and Jolly]. These "shortfalls" will have a significant impact on the earnings and the liquidity of those who make loans to farmers. Furthermore, lenders will encounter significantly higher loans loss ratios in the future. **Melichar has indicated that these ratios have risen dramatically for commercial** banks and similar data indicates equal or more rapid deterioration in the portfolios of the Farm Credit System Agencies (PCAs, FLBs). Analysis by Reinders indicates that with three to five percent loss ratios (which some lenders are now encouraging) even a very financially sound lender with 20 percent equity can remain in business for only three to four years [Reinders].

The agricultural input supply firms have financial problems as well. Ginder indicates that there has been a 400 percent increase in accounts receivable write-offs (losses) from 1981 to 1984 in a representative sample of cooperative input supply firms in the Central States [Ginder]. Approximately one-third of the sample firms have debt-to-asset ratios exceeding 70 percent. If bad debts total one to two percent of sales, 25 percent of these firms will have debt servicing problems, and bad debts of three to four percent of sales would almost double the number of firms with debt servicing problems. Currently, these firms have one percent of sales in accounts receivable out-standing for 180 days or more (much of which will not be collected), and another one percent in accounts receivable of 60 to 180 days. Thus, many agribusiness firms are also financially vulnerable and a relatively small increase in nonpayment on accounts receivable or a loss due to a farmer bankruptcy would threaten their survival.

One final point concerning the broader effects of the financial problems of agriculture. Paulsen and Otto have estimated that from 1977 to 1984 we have lost approximately 260,000 jobs in the agriculturally related industries (input supply and product processing and the industries from which they purchase inputs; i.e., steel, chemicals, petroleum, etc.) because of the agricultural recession [Paulsen and Otto]. They estimate an approximate $5.1 billion loss in income in the non-farm sector due to the farm recession. Clearly these reductions in income and employment cannot be attributed to the current debt crisis in agriculture, but they do indicate that over a longer period of time, the economic and financial problems of farmers are felt throughout the rest of the economy, not in the form of higher priced food, but in the form of fewer employment opportunities and lower incomes for those in farm related industries.

Causes

The roots of the financial problems of farmers today can be traced to the environment of the 1970s and the dramatic changes in that environment during the early 1980s. The decade of the 1970s can be characterized by high inflation rates, growing foreign and domestic demand for farm products, very low or negative real rates of interest, and a willingness to substitute asset appreciation for current earnings. Farmers borrowed heavily to purchase capital inputs and farmland and to aggressively expand their operations. Then in the 1980s interest rates rose to unprecedented high levels, foreign and domestic demand for farm commodities declined significantly because of world wide recession, incomes dropped dramatically, and land values began a steady and relatively steep decline. Those farmers with high debt loads found it difficult to collateralize and service that debt with high interest rates, low incomes, and decreasing land values.

To more accurately evaluate the relevance of public policy and, in particular, traditional farm income, and price support programs, to the current financial problems in agriculture, it is important to understand the broader dimensions of today's farm problem. Clearly, farm incomes are lower than they were during a large part of the 1970s, but similar income levels were encountered in prior years without the severity of the financial pressures currently being felt. In fact, there are six additional characteristics of the current financial stress in agriculture, and some of them will be only indirectly impacted by price and income support programs.

In addition to lower incomes, farmers have a much higher debt-to-income ratio than in prior years. Based on USDA data, aggregate debt of the U.S. agricultural sector was approximately 90 percent of net farm income in 1950, resulting in a debt to income ratio of less than one. This ratio rose to two in 1960, to approximately three in 1970, and now stands in excess of ten to one [Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1982].[1] Although nonfarm income of farmers has increased in relative importance in recent years, this income is concentrated on smaller farms that have lower debt loads, so does not significantly improve the debt carrying capacity of those farmers with the majority of the debt [Melichar, November 1984]. Thus, farmers are attempting to carry a much larger debt load per dollar of debt surviving capacity (i.e., income) which adds to their financial pressure. In fact, to obtain a debt-to-income ratio representative of the mid-1970s would require incomes to more than triple, not a realistic possibility in the near future. Furthermore, the maturity structure on debt has shortened; farmers with lower incomes and higher debt loads are being required to repay that debt more rapidly. Institutional lenders such as banks and PCAs have shortened maturities to reduce their interest rate risk exposure. Although Federal Land Banks and other long-term institutional lenders have not adjusted terms significantly, land contracts, which comprise a substantial portion of farm real estate debt, have become shorter in maturity in recent years.

Another balance sheet adjustment which has occurred on many farms is that of reduced liquidity. In 1950 approximately 27 percent of the asset base on the typical farm firm was liquid (i.e., financial assets or crop and livestock inventories); in 1980 only 11 percent was liquid [Economic Indicators of the Farm Sector: Income and

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[1] Melichar has recalculated this ratio for 1983 by adjusting total income and debt by an estimate of the amount attributable to landlords [Melichar, November 1984]. The result is a lower debt to income ratio in 1983 than that obtained with unadjusted data. However, similar adjustments must be made in earlier years to obtain comparable data, suggesting that the trend of a significantly rising debt to income ratio over time still occurs.

Balance Sheet Statistics, 1982].[2] In the past, liquidity provided a safety valve for that farmer who did not generate sufficient inome to meet the debt servicing requirement; he or she could sell part of the liquid asset base without sacrificing part of the productive plant—the land, machinery or breeding stock. Today, liquidity is gone—forcing some farmers to consider selling part of the fixed asset base to service their indebtedness.

In reality, farmers dramatically restructured their balance sheets during the 1970s, increasing the amount of fixed assets compared to inventories and other assets easily converted to cash in times of financial stress; and increasing the amount of current liabilities compared to longer term obligations, thus adding to the current debt servicing requirements. Improved farm incomes will help reduce the financial stress in agriculture, but will only eliminate this mismatching of assets and liabilities if farmers use the additional income to either pay down debt or increase liquidity rather than purchase fixed assets. Even if farmers use their improved incomes to restructure their balance sheets, the process will be slow—thus suggesting that financial stress will be a long-run problem for the agricultural sector.

An additional characteristic of the current financial stress in agriculture is the increased income and collateral risk faced by most farmers. A significant change in government policy in the 1980s resulted in a reduced safety net for agriculture and a movement to gradually transfer the responsibility for managing risk from the government to the individual farmer. This change in philosophy is reflected in the substitution of crop insurance for disaster programs, the changing role of the Farmers Home Administration, and the approach to government farm programs that provides incentives for participation but is not structured to necessarily benefit those who do not participate and pay the "insurance premium." Although the income risk in agriculture may not be significantly larger this decade than last, the responsibility for managing that risk is being transferred from the public to the private sector. Some farmers still have not accepted this concept.

In addition to income risk, farmers are now facing collateral risk as well. During the three decades from 1950 to 1980, even when farm incomes turned down, the lending community was willing to extend credit to the agricultural sector because collateral values (specifically land values) were stable or rising. A key reason lenders have turned conservative during the last four years is that in addition to income risk, they are facing reduced collateral values and deteriorating security positions. Legitimately so, the borrower who has financial loses combined with declining collateral is perceived to be less credit-worthy than one who has financial losses but stable or rising collateral values.

A further consequence of declining collateral values is that the traditional safety valve of the 1970s for farmers who could not meet the cash flow—that of refinancing—is either no longer available, or is quite costly because of higher interest rates. In reality, the agricultural sector no longer has a financial safety valve; adjustments on the liability side of the balance sheet to reduce financial pressure by extending the terms on the debt are no longer possible for many operators, and liquidity is nonexistent in many cases. Thus, a significant number of farmers are having to consider asset liquidations as a means of reducing or eliminating the financial pressures they are facing.

A seventh characteristic of today's financial stress in agriculture is that of higher and more volatile interest rates [Melichar, January, 1984]. When queried as to what is the fundamental reason why they have encountered financial difficulties, many farmers respond that they did not anticipate the dramatic rise in interest rates that occurred from the mid-1970s to 1980. A shift from relatively low real and nominal interest rates to relatively high rates is particularly devastating for an industry like agriculture that has a large proportion of its total debt used to finance fixed assets on a variable rate. In other industries with a larger proportion of the debt used in inventory financing, it is easier to adjust debt utilization to rising interest rates. Because of the dominance of fixed assets in the asset base of the agricultural sector, and the necessity to finance those fixed assets with longer term financial obligations, it has been much more difficult for the farm sector to adjust to rising rates than other sectors of our economy.

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[2] Melichar has argued that the USDA Balance Sheet of Agriculture significantly understates financial assets in the agricultural sector, but even with his adjustments the proportion of total assets that were liquid (financial assets plus crop and livestock inventories) in 1980 is not altered substantially [Melichar, 1983].

THE 1985 FARM BILL

The current debate about the 1985 Farm Bill is occurring in the aforementioned environment of severe financial stress for farm and agri-business firms. How then does this environment impact the choices with respect to the provisions of the 1985 Farm Bill? First, although providing substantially more income and price support through a farm program will probably not significantly alleviate the financial stress for many farmers, the reverse is not true. Research completed by the Food and Agricultural Policy Research Institute [FAPRI] indicates that rapid movement to a market oriented farm program would result in significantly lower prices and net farm income [Johnson, et al.] A comparison between a continuation of the current farm program and a market oriented program much like that proposed by the Reagan Administration indicates that corn or wheat prices would be approximately 15-20 percent lower and net farm income would be 5 to 10 billion dollars lower under the free market option (a 30-40% reduction in net farm income). This significant reduction in income would dramatically compound the financial stress problem. For example, the shortfalls in interest payments to lenders would more than double from their current $2.2 billion level, and principal repayment shortfalls would increase by 25-30 percent [Doye and Jolly]. Land values which have fallen by approximately 40 percent in Iowa since 1981 to an average value of $1,349 per acre would have to decline by another approximately 50 percent if corn prices (market price plus government payment) were to stablize at $2.50 = $2.60 per bushel as suggested by the FAPRI analysis of the free market option [Barkema]. This decline in land values would further undermine the collateral base for much of the agricultural loan portfolio of the agricultural lending community. Thus, rapid movement to a market oriented farm program as proposed by the Administration would significantly compound the financial stress in agriculture and lead to greater losses in the financial markets or increased costs of public financial assistance programs which will offset in part the cost savings in commodity programs.

A second issue concerns an explicit response to the financial stress problem. Consideration should be given to a provision in the 1985 Farm Bill that would target some of the benefits to those who currently are encountering financial stress. One alternative approach would be to implement a targeted interest rate buy-down that would reduce farmers interest rates and cover part or all of the interest payment shortfalls. Such a buy-down would not be available to all farmers irrespective of their debt obligations, but would be targeted to those whose debt load is heavy and cash flow is insufficient to meet debt obligations [Boehlje, et al.]. Another alternative is to authorize the formation of an entity to acquire non-performing debt (and possibly the indebted assets) and isolate them from the markets. The objective of such a policy is to develop an alternative to foreclosure and sale of indebted assets by private sector lenders, which given the large number of non-performing loans, would likely result in a glut of land and other capital assets on the markets and depress prices and collateral values even further. This entity would be a temporary "holding tank" for excess land that could not be absorbed by the market. Such an entity—an Agricultural Credit Corporation—has been proposed by Professor Harl of Iowa State University [Harl]; a variation of this entity called an Agricultural Conservation Corporation has been proposed by the Farm Credit Council [Farm Credit Council]. If the entity did accrue property, it could not only protect burdened farm real estate markets, but it could also be placed in a conservation reserve to reduce soil erosion and excess productive capacity. A further variation of this concept is to authorize the formation and block grant funding of state Agricultural Investment Banks that would acquire indebted assets from lenders and others, as well as make loans to facilitate the acquisition of land by credit-worthy borrowers.

CONCLUSIONS

Data from Iowa and other states along with that from the U.S. Department of Agriculture indicate that a significant number of farmers are suffering financial stress. This stress is a result of the many changes in the financial environment for agriculture, and is not simply a result of lower incomes. Other factors that contribute to the financial stress problem of the U.S. agricultural sector are a higher debt load, shorter maturities on debt, reduced liqiduity, higher and more volatile interest rates, increased income and collateral risk, limited availability of refinancing alternatives, and asset liquidations. Government policies of the past have contributed to today's financial stress by encouraging higher land values, more debt utilization, growth in farm size, and higher interest rates.

Given the complex nature of the financial stress problem, a public policy approach that focuses only on one characteristic of that problem will probably be ineffective. Specifically, price and income support programs which have been the major component of agricultural policy in the past may be quite ineffective in solving the current financial stress problem—such programs do not focus on some of the major dimensions of the stress problem (i.e. loan maturities, liquidity, collateral risk, etc.), and furthermore quite likely will not be targeted to those individuals who have financial stress. However, reducing the government safety net for agriculture by lowering price and income supports will dramatically compound the problem of financial stress in agriculture because lower prices will result in significantly lower land values and further loan defaults.

Various policy options that are more targeted to the financial stress problem have been identified including interest rate buy-downs, debt moratoriums, debt restructuring, bankruptcy, asset restructuring, recapitalization, etc. While spiraling farm debt suggests that debt restructuring is the answer to the current financial stress, a restructuring of agricultural assets remains the key to a long-term solution. The rearranging of liabilities is not a permanent solution to the current financial stress, because even with more time to repay, many farmers will not be able to service their debt with current or expected interest rates, productivity, and input and commodity prices. However, debt restructuring is an important mechanism for buying time to implement more permanent solutions. Interest rates buy-downs may also be an effective short-run policy to buy time. But asset restructuring including liquidations, debt reductions, and equity infusions will be required to improve the chances of long-term survivability of many farm businesses.

One of the key objectives of any public policy to alleviate financial stress should be to protect the resource markets from collapsing—stabilizing resource values is critical to maintaining the stability of the agricultural production sector and rural communities. If resource values decline precipitously because of excessive supplies being offered to a market that has no liquidity to absorb them, many farmers who were a "good credit risk" will no longer be so because of declining collateral values. Mechanisms to stablize land values at economically supportable levels including new loan agencies such as agricultural investment banks or a land holding entity such as an agricultural land reserve should be evaluated to minimize the potential of a land market collapse.

Table 1. U.S. Farms: Debts and Assets by Leverage

	Debt to Asset Ratio (percent)				
	0-10	11-40	41-70	71+	Total (%)
Operators (%)	58	24	11	8	100
Debt (%)	5	32	32	31	100
Assets (%)	47	32	14	8	100

Source: Melichar Jan. 84 Federal Reserve Bulletin.

Table 2. Estimated Percentage Distributions of Sample Farm Operators, Their Assets and Liabilities by Relative Debt Levels*

	Debt-to-Asset Ratios			
	0-10	11-40	41-70	71+
Percent operators	36	35	18	10
Percent Assets	30	40	21	9
Percent Liabilities	3	32	40	25

Source: Farm Finance Survey, March 1984, Iowa Departmet of Agriculture.

*Totals may not equal 100 due to rounding errors.

Table 3. Estimated Percentage Distributions of Iowa Farm Operators, Their Debt and Assets by Farm Size and Debt Level Categories*

		Debt-to-Asset Ratio (%)			
		0-10	11-40	41-70	#71
Farm Size **					
	Number in Sample	13	7	7	5
Very small	% Operators	41	22	22	16
	% Assets	39	25	25	11
	% Debt	0	25	41	34
	Number in Sample	61	45	25	17
Small	% Operators	41	30	17	11
	% Assets	41	31	18	11
	% Debt	3	25	33	38
	Number in Sample	211	199	95	58
Medium	% Operators	37	35	17	10
	% Assets	34	37	18	11
	% Debt	3	31	35	31
	Number in Sample	29	55	33	6
Large	% Operators	24	45	27	5
	% Assets	24	45	26	5
	% Debt	4	35	47	14
	Number in Sample	314	306	160	86
All	% Operators	36	35	18	10
	% Assets	30	40	21	9
	% Debt	3	32	40	25

Source: Farm Finance Survey, March 1984, Iowa Department of Agriculture.

*Totals may not equal 100 due to rounding errors

**Size Category	Assets
Very Small	Under $50,000
Small	$50,000 - $199,999
Medium	$200,000 - $999.999
Large	$1,000,000 and over

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STATEMENT OF EMANUEL MELICHAR, SENIOR ECONOMIST, ECONOMIC ACTIVITY SECTION, DIVISION OF RESEARCH AND STATISTICS, BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM

AGRICULTURAL BANKING EXPERIENCE, 1984

After experiencing a major boom during the last decade, the farm sector is in the sixth year of a period of lower and relatively stagnant income, with poor prospects for near-term improvement. Reduced income flows and the consequent decline in land prices, plus sharply higher interest rates, have in this period produced severe financial stress for those farmers who borrowed heavily to expand their enterprises during the concluding years of the boom. The progressive erosion of the equality of these farmers, who owe most of the total farm debt, has been increasing the incidence of problem farm loans at banks and other farm lenders.

Charge-offs of farm loans at banks

Net charge-offs of farm production loans, an item added to bank reports last year, in 1984 were equal to 2.2 percent of such farm loans outstanding at year-end. Relative farm loan charge-offs were highest by far in California; charge-offs in the other 49 states averaged 1.8 percent of loans. As shown in Table 1, other states with relatively high farm loan charge-offs were in the western Corn Belt, Great Plains, and Southeast. (See additional detail in Appendix Section A.)

As data presented later will indicate, the relative rate of farm loan charge-offs at all banks was nearly double that for all loans at agricultural banks, and that rate in turn was about double the rate of charge-offs of all loans at other small banks.

Net charge-offs of farm production loans totaled about $900 million in 1984, of which about $240 million was reported by banks in California.

(Note.—All data for 1984 are preliminary estimates based on reports available on March 8, 1985, when over 99 percent of banks had reported but regular editing was not complete. Special editing of some items was performed in compiling this report.)

TABLE 1.—*Net charge-offs of farm loans in 1984 as a percentage of farm loans outstanding at year-end*

United States	2.2
California	6.1
Other States	1.8
Other states about 1.8 percent:	
Missouri	3.0
Iowa	2.9
Alabama	2.7
Nebraska	2.5

Georgia	2.3
Minnesota	2.3
Kansas	2.1
Illinois	1.9
Oklahoma	1.9
South Dakota	1.9

Deliquent farm loans at banks

Banks have been reporting amounts of deliquent farm loans since December 1982; however, the data are incomplete because only relatively large banks (assets of $100 million or more) report nonaccrual and renegotiated farm loans. These large banks account for only 31 percent of farm production loans at banks nationally, and for much smaller percentages in highly rural states.

Table 2 presents data on farms loans that are past due but still accruing interest, which must be reported by most banks engaged in farm lending. At year-end, these past due loans represented 3.8 percent of farm loans outstanding a level that has not changed much since 1982. During this period, however, the proportion of farm loans past due fell in some states, such as California, but rose somewhat in most midwestern states (See additional detail in Appendix Section B.)

At large banks required to report all categories of deliquent farm loans, the total (past due, nonaccrual, and renegotiated "troubled" debt) has remained near 10 percent of outstanding loans over the past two years. (See Appendix C.) Farm lending at these banks, however, is disproprtionately concentrated in California, where large banks make most farm loans. At year-end, the total delinquent farm production loans at large California banks average 13 percent of loans outstanding, compared with 9 percent at large banks in other states. The nonaccrual component averaged 8 percent of loans outstanding in California, compared with just under 5 percent in other states. But these relatively high farm loan delinquencies did not pose a serious threat to the large California banks because farm loans represented only about 4 percent of total loans at these banks (the same proportion as at all banks nationally).

TABLE 2.—PAST DUE FARM LOANS AS PERCENTAGE OF FARM LOANS OUTSTANDING DECEMBER 31

Area	1982	1983	1984	Percentage of area's bank farm loans at reporting banks
Farm loans past due 30 to 89 days and still accruing interest:				
United States	2.6	2.5	2.6	90
California	6.0	6.7	3.3	98
Iowa	1.5	1.7	2.3	96
Missouri	1.9	2.2	3.4	91
Nebraska	1.4	1.5	1.5	96
Farm loans past due 90 days or more and still accruing interest:				
United States	1.2	1.1	1.2	90
California	2.9	2.3	1.5	98
Iowa	.7	.9	1.2	96
Missouri	1.3	1.0	1.5	91
Nebraska	.5	.8	.9	96

Though small banks have not been required to report nonaccrual farm loans, they do report their total nonaccrual loans. From these data, shown later in Table 4, it appears that about 3 percent of the farm production loans at small banks may be in the nonaccrual category. When this figure is averaged with the 5.8 percent of loans in nonaccrual status at the larger banks that account for 31 percent of farm loans outstanding, about 3.8 percent of all farm production loans are estimated to be in the nonaccrual category.

Thus, as shown in Table 3, about 5 percent, or $2 billion, of all farm production loans were nonperforming at year-end. Another 2.6 percent, or about $1 billion, was reported as past due 30 to 89 days. Thus about $3 billion of farm production loans at banks were delinquent.

TABLE 3.—ESTIMATED DELINQUENT FARM PRODUCTION LOANS AT COMMERCIAL BANKS DEC. 31, 1984

Class of delinquent loans	Estimated delinquent loans—	
	Billions of dollars	As percentage of outstanding farm production loans
Past due 30 to 89 days and still accruing	1.0	2.6
Nonperforming:		
Past due 90 days or more and still accruing	.4	1.1
Nonaccrual	1.5	3.8
Renegotiated	.1	.2
Total nonperforming	2.0	5.1
Total delinquent	3.0	7.6

Experience of agricultural banks

Although farm loans constitute only 4 percent of all loans outstanding at banks, many small banks have a much higher farm loan ratio. The "unweighted" average of the farm loan ratios at all banks is now about 17 percent, and about 5,000 "agricultural" banks now have a ratio that exceeds that average. The financial experience of these banks has recently been dominated by the rise in farm loan delinquencies.

In Table 4 and several other tables that follow, the top panel contrasts the experience banks (banks with assets under $500 million and a below-average farm loan ratio). Then in the lower panel, additional insight into the effect of farm loans on bank experience is provided by data for all small banks divided into 18 classes according to the relative importance of farm lending at the bank.

Two years ago, loan delinquencies were still lower at agricultural banks than at other small banks. At the latter banks, relative delinquencies were peaking as the business recession was ending, while delinquencies at agricultural banks were rising from a lower level. By the end of 1983, delinquent loans at agricultural banks reached the same relative level as the recession peak at other small banks. A year later, at the end of 1984, delinquent loans at agricultural banks had risen further, to 6.2 percent of total loans, well above the average of 4.7 percent at other small banks.

Of the four categories of delinquent loans, nonaccrual loans rose most rapidly during the past two years, especially at the banks most heavily concentrated in farm lending. (See Appendix Section D.) At banks with a farm loan ratio over 50 percent, for example, nonaccrual loans rose from an average of around 0.5 percent of total loans in December 1982 to about 2.5 percent of total loans two years later.

TABLE 4.—DELINQUENT LOANS AS A PERCENTAGE OF TOTAL LOANS DECEMBER 31

Banks by size and by farm loan ratio	Total delinquent loans			Nonaccrual loans		
	1982	1983	1984	1982	1983	1984
Agricultural banks	4.9	5.2	6.2	0.8	1.2	2.0
Other small banks	5.2	4.6	4.7	1.1	1.1	1.2
Banks with total assets under $500 million:						
Farms loans as percentage of total loans at bank:						
Under 1	5.4	4.5	4.4	1.2	1.1	1.1
1 to 4	4.9	4.6	4.7	1.0	1.1	1.2
5 to 9	5.1	5.0	5.0	.8	1.1	1.2
10 to 14	5.4	5.1	5.6	.9	1.1	1.5
15 to 19	5.4	5.5	6.0	.9	1.2	1.7
20 to 24	5.5	5.5	5.9	.8	1.2	1.6
25 to 29	5.0	5.4	6.5	.7	1.1	1.9
30 to 34	5.2	5.4	6.0	.8	1.1	1.8

TABLE 4.—DELINQUENT LOANS AS A PERCENTAGE OF TOTAL LOANS DECEMBER 31—Continued

Banks by size and by farm loan ratio	Total delinquent loans			Nonaccrual loans		
	1982	1983	1984	1982	1983	1984
35 to 39	5.1	5.5	6.2	.8	1.2	1.8
40 to 44	5.0	5.8	6.4	.8	1.5	2.1
45 to 49	4.8	5.0	6.5	.8	1.2	2.2
50 to 54	4.7	5.7	6.4	.8	1.8	2.0
55 to 59	4.0	4.6	6.1	.5	1.1	2.3
60 to 64	3.8	4.9	6.5	.6	1.4	2.7
65 to 69	4.2	4.6	6.0	.7	1.1	2.5
70 to 74	3.4	4.3	6.3	.5	1.1	2.4
75 to 79	3.3	4.6	5.2	.4	1.4	2.0
80 and over	2.4	3.6	5.4	.2	.8	2.8

Total loan charge-offs, for which there are data over a longer period, have risen substantially at agricultural banks since 1980. At 1.2 percent of year-end loans, as shown in Table 5, net charge-offs at agricultural banks were double the relative level at other small banks—the opposite of the situation that prevailed for many years before 1983. At the more heavily agricultural banks, average net charge-offs were still higher—betwen 1.5 and 2.0 percent of loans outstanding.

Net income at agricultural banks was sharply reduced by their loan losses, as shown in Table 6. However, these banks had been relatively profitable, and in 1984 their return to equity still averaged 9 percent. But in each year since 1980, an increased proportion of agricultural banks experienced loan losses larger than could be covered by annual net earnings. In 1984, 16 percent of agricultural banks made loan loss provisions that exceeded 2.5 percent of year-end loans outstanding. Mostly because of such adverse loan experience, 12 percent of agricultural banks reported negative net income for 1984, compared with an average of only 1 percent during the 1970s. On the other hand, 32 percent of agricultural banks needed loan loss provisions equal to less than 0.4 percent of outstanding loans in 1984, and 59 percent needed provisions of less than 1.0 percent. Such relatively low losses enabled nearly a fifth of all agricultural banks to report earning more than 15 percent on equity in 1984, and over half earned more than 10 percent. (See Appendix Section E.)

Because most agricultural banks maintained positive earnings while their growth was slowed by the weak farm economy, the ratio of capital to assets at these banks rose slightly further in 1984, to an average of 9.5 percent. As shown in Table 7, the capital ratio at agricultural banks now averages a full percentage point above that at other small banks.

TABLE 5.—NET CHARGE-OFFS ON LOANS AND LEASES AS A PERCENTAGE OF TOTAL LOANS AND LEASES OUTSTANDING AT YEAR-END

Banks by size and by farm loan ratio	1979	1980	1981	1982	1983	1984
Agricultural banks	0.21	0.32	0.43	0.69	0.93	1.21
Other small banks	.30	.39	.40	.61	.66	.59
Banks with total assets under $500 million:						
Farm loans as percentage of total loans at bank:						
Under 1	.33	.40	.40	.60	.56	.54
1 to 4	.28	.37	.38	.63	.80	.59
5 to 9	.24	.41	.41	.61	.72	.73
10 to 14	.28	.38	.42	.71	.79	.87
15 to 19	.24	.33	.44	.65	.86	.93
20 to 24	.26	.32	.44	.70	.94	.86
25 to 29	.24	.33	.41	.62	.88	1.10
30 to 34	.21	.38	.47	.63	.98	1.13
35 to 39	.21	.31	.41	.78	.97	1.21
40 to 44	.20	.31	.44	.66	.88	1.35
45 to 49	.14	.32	.34	.48	.89	1.35
50 to 54	.19	.36	.37	.77	1.07	1.42
55 to 59	.14	.33	.52	.62	1.10	1.71
60 to 64	.15	.33	.36	.73	.73	1.66

TABLE 5.—NET CHARGE-OFFS ON LOANS AND LEASES AS A PERCENTAGE OF TOTAL LOANS AND LEASES OUTSTANDING AT YEAR-END—Continued

Banks by size and by farm loan ratio	1979	1980	1981	1982	1983	1984
65 to 69	.13	.22	.42	70	1.00	1.61
70 to 74	.12	.33	.42	.53	.96	1.97
75 to 79	.14	.22	.32	.86	.90	1.62
80 and over	.06	.25	.43	.69	.89	1.92

TABLE 6.—RATE OF RETURN TO EQUITY

[In percent]

Banks by size and by farm loan ratio	1979	1980	1981	1982	1983	1984
Agricultural banks	15	16	15	14	11	9
Other small banks	14	14	13	12	12	12
Banks with total assets under $500 million:						
Farm loans as percentage of total loans at bank:						
Under 1	14	13	13	12	12	12
1 to 4	14	14	12	12	11	12
5 to 9	15	14	13	12	11	12
10 to 14	14	14	12	11	11	10
15 to 19	15	14	14	12	12	10
20 to 24	15	15	14	13	11	10
25 to 29	15	15	14	13	11	9
30 to 34	15	15	14	14	11	9
35 to 39	16	16	15	13	11	8
40 to 44	15	16	15	14	11	8
45 to 49	16	16	16	14	12	8
50 to 54	16	16	16	14	11	9
55 to 59	16	17	16	15	12	7
60 to 64	16	17	17	15	13	7
65 to 69	16	18	17	15	12	9
70 to 74	16	17	18	17	12	7
75 to 79	15	18	18	15	13	9
80 and over	17	18	17	16	13	7

TABLE 7.—CAPITAL RATIO

[In percent]

Banks by size and by farm loan ratio	1979	1980	1981	1982	1983	1984
Agricultural banks	9.0	9.2	9.2	9.3	9.4	9.5
Other small banks	8.5	8.6	8.6	8.5	8.4	8.5
Banks with total assets under $500 million:						
Farm loans as percentage of total loans at bank:						
Under 1	8.4	8.5	8.6	8.4	8.2	8.4
1 to 4	8.5	8.6	8.5	8.4	8.3	8.4
5 to 9	8.5	8.7	8.7	8.8	8.7	8.7
10 to 14	8.8	8.9	8.9	8.9	8.8	9.0
15 to 19	8.8	9.0	8.9	8.9	8.9	8.9
20 to 24	8.9	9.1	9.0	9.0	9.1	9.2
25 to 29	8.9	9.0	8.9	8.9	9.0	9.2
30 to 34	8.8	9.2	9.1	9.2	9.1	9.2
35 to 39	9.0	8.9	9.3	9.2	9.4	9.3
40 to 44	9.0	9.2	9.1	9.2	9.3	9.5
45 to 49	9.1	9.3	9.3	9.5	9.5	9.6
50 to 54	9.2	9.3	9.6	9.7	9.9	9.9
55 to 59	9.4	9.6	9.6	9.7	10.0	10.2
60 to 64	9.3	9.6	9.7	9.7	9.9	10.1
65 to 69	9.5	9.7	9.8	9.8	10.3	10.5

TABLE 7.—CAPITAL RATIO—Continued

[In percent]

Banks by size and by farm loan ratio	1979	1980	1981	1982	1983	1984
70 to 74	9.4	10.1	10.0	10.3	10.5	10.8
75 to 79	10.1	10.2	10.4	10.7	11.0	11.2
80 and over	10.4	10.6	11.0	11.1	11.8	11.9

Furthermore, average capital ratios are highest at the most heavily agricultural banks, at which they also rose in spite of increased farm loan losses.

The favorable capital position of most agricultural banks provides a valuable, but limited, cushion for coping with adverse loan experience. If relatively large loan losses occur in a short period of time and thus cannot be covered from current earnings, capital can be depleted rapidly. At agricultural banks, loans average about 50 percent of assests and capital about 10 percent of assets; therefore, loan losses equal to about 20 percent of outstanding loans would, on average, deplete all capital.

During the past two years, banks that have failed have come predominatley from the group that had earlier reported levels of delinquent loans that exceeded total capital. Table 8 indicates that the number of such banks rose by about one-third during 1984, to over 600 banks at year-end, or 4 percent of all banks. There were significant increases in the number of such banks in several highly agricultural states; yet, in most of these states—Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and Wisconsin—the proportion of banks in this condition at the end of 1984 was still only roughly equal to the national average of 4 percent. Furthermore, as shown in the last column of the table, farm loans at such banks nationally averaged only 7 percent of total loans at the banks. In several states with a relatively high number of these potentially vulnerable banks—California, Colorado, Florida, Louisiana, Oklahoma, Tennessee, and Texas—their low average farm loan ratio indicates that farm loan difficulties play, on average, a minor role in loan problems at these banks.

TABLE 8.—BANKS AT WHICH PAST DUE AND NONPERFORMING LOANS EXCEEDED TOTAL CAPITAL DECEMBER 31

State	Number of banks			As percentage of all banks in State, 1984	Farm loans at these banks, 1984	
	1982	1983	1984		Millions of dollars	As percentage of total loans at these banks
United States	459	453	614	4	2,198	7
Arkansas	3	6	8	3	21	15
California	56	46	45	10	66	1
Colorado	15	16	36	8	117	11
Florida	6	9	17	4	4	(1)
Illinois	35	25	22	2	45	11
Indiana	6	14	12	3	29	12
Iowa	6	6	33	5	292	44
Kansas	6	13	28	4	160	43
Kentucky	7	7	10	3	18	11
Louisiana	19	24	40	13	63	3
Michigan	20	13	4	1	10	7
Minnesota	21	30	33	4	174	27
Missouri	14	15	32	5	160	24
Montana	12	8	20	12	126	24
Nebraska	8	14	22	5	117	58
New Jersey	1	6	6	5	5	1
North Dakota	4	5	9	5	94	38
Ohio	7	4	9	3	22	17
Oklahoma	16	23	37	7	96	6
Oregon	23	19	13	18	45	17

TABLE 8.—BANKS AT WHICH PAST DUE AND NONPERFORMING LOANS EXCEEDED TOTAL CAPITAL DECEMBER 31—Continued

State	Number of banks			As percentage of all banks in State, 1984	Farm loans at these banks, 1984	
	1982	1983	1984		Millions of dollars	As percentage of total loans at these banks
Tennessee	31	33	23	8	32	7
Texas	27	29	54	3	56	3
Utah	14	9	9	15	13	7
Washington	6	5	9	9	201	3
West Virginia	6	8	11	5	3	1
Wisconsin	13	17	19	3	73	19
Wyoming	8	8	15	13	60	16

[1] Less than 0.5 percent

Data are shown for States that accounted for at least 1 percent of the national total of such banks in 1984 or at least 2 percent of the total in 1982 or 1983.

The relative proportions of agricultural and other small banks troubled by problem loans over the past two years are contrasted in Tables 9 and 10. In each panel of these tables, banks are symmetrically cross-classified by relative capital and relative total delinquent loans on the date specified. Thus, in each panel, banks below the diagonal line have delinquent loans equal to (approximately) or greater than capital. In December 1982, more of the small nonagricultural banks (Table 9) than of the agricultural banks (Table 10) had relatively high proportions of delinquent loans. Over the next two years, shown in the second and third panels of the tables, the situation among nonagricultural banks changed little while that at the agricultural banks deteriorated until, by December 1984, it appeared somewhat worse than at the other banks.

Table 9

Percentage distribution of small nonagricultural banks, by ratios of capital to assets and total delinquent loans to assets

Total delinquent loans as a percentage of total assets	Capital as a percentage of total assets						
	Under 3.0	3.0 to 5.9	6.0 to 8.9	9.0 to 11.9	12.0 to 14.9	15.0 to 17.9	18.0 and over
December 31, 1982							
Under 3.0..........	*	1.5	35.1	19.4	4.7	1.6	3.5
3.0 to 5.9.........	*	.7	14.1	8.0	1.3	.3	.4
6.0 to 8.9.........	*	.3	3.3	2.2	.3	.1	.1
9.0 to 11.9........	*	.2	1.0	.5	.1	*	.1
12.0 to 14.9.......		.1	.3	.1	.1		*
15.0 to 17.9.......		.1	.1	.1	*	*	
18.0 and over......	*	.1	.1	.1	*	*	
December 31, 1983							
Under 3.0..........	*	2.0	38.7	19.3	4.6	2.0	3.3
3.0 to 5.9.........	.1	.8	13.3	6.5	1.4	.4	.4
6.0 to 8.9.........	.1	.3	2.6	1.4	.3	.1	.1
9.0 to 11.9........	.1	.2	.6	.4	.1	*	*
12.0 to 14.9.......	*	.1	.3	.1	.1	*	*
15.0 to 17.9.......	*	*	.1	.1			*
18.0 and over......	*	*	.1	*	.1	*	
December 31, 1984							
Under 3.0..........	.1	1.7	36.9	18.0	4.5	2.0	3.5
3.0 to 5.9.........	*	.8	14.8	6.7	1.3	.5	.3
6.0 to 8.9.........	*	.3	3.3	1.7	.3	.1	.1
9.0 to 11.9........	*	.2	1.0	.4	.1	*	.1
12.0 to 14.9.......		.1	.4	.2	.1	*	*
15.0 to 17.9.......	*	.1	.1	*		*	*
18.0 and over......	*	*	.1	*	*	*	*

* Less than 0.5 percent (1 to 4 banks).

Table 10

Percentage distribution of agricultural banks, by ratios of capital to assets and total delinquent loans to assets

Total delinquent loans as a percentage of total assets	Capital as a percentage of total assets						
	Under 3.0	3.0 to 5.9	6.0 to 8.9	9.0 to 11.9	12.0 to 14.9	15.0 to 17.9	18.0 and over
December 31, 1982							
Under 3.0..........	*	.2	29.5	31.3	7.7	2.0	1.2
3.0 to 5.9.........		.2	10.5	8.8	1.8	.4	.1
6.0 to 8.9.........		.1	2.3	2.0	.4	.1	*
9.0 to 11.9........		*	.5	.4	.1	*	
12.0 to 14.9.......		.1	.1	.1	*		
15.0 to 17.9.......			.1	.1			
18.0 and over......		*	*	*	*		
December 31, 1983							
Under 3.0..........		.2	25.9	30.0	8.9	2.1	1.3
3.0 to 5.9.........		.2	11.3	9.4	2.1	.5	.1
6.0 to 8.9.........		.2	2.3	2.1	.6	.2	
9.0 to 11.9........	*	.1	.6	.6	.2		
12.0 to 14.9.......		.1	.2	.2	.1		*
15.0 to 17.9.......		*	.1	*	*		
18.0 and over......			*		*		
December 31, 1984							
Under 3.0..........		.2	20.9	26.7	8.6	2.4	1.6
3.0 to 5.9.........		.2	12.8	11.0	2.9	.5	.3
6.0 to 8.9.........	*	.2	3.5	3.3	.5	.1	.1
9.0 to 11.9........	*	*	1.2	.9	.1		*
12.0 to 14.9.......	.1	.1	.6	.4	.2		
15.0 to 17.9.......	*	*	.1	.1	*		
18.0 and over......	*	.1	.1	.2	*		

* Less than 0.5 percent (1 or 2 banks).

A more vulnerable subgroup of the banks discussed above consists of the banks at which nonperforming loans alone exceed total capital. Tables 11, 12, and 13 repeat the preceding analysis using this more stringent criterion. The last column of Table 11 indicates that farm loans figure more prominently at these banks, averaging 15 percent of total loans. And, whereas Table 12 shows that the number of small nonagricultural banks in this predicament changed little over the last two years, in Table 13 the number of agricultural banks below the diagonal more than tripled over two years—but is still smaller than the number of nonagricultural banks in the same position in Table 12.

In 1983, only 7 of the 44 insured commercial banks that failed, or 16 percent, were agricultural banks. Last year, 32 of the 78 failures listed in Table 14, or 41 percent, were agricultural banks. Still, farm loans constituted only 10 percent of total loans at the banks that failed in 1984, and totaled only $199 million at these banks at the beginning of that year. Growth last year in the number of agricultural banks with a relatively high level of nonperforming loans (the number of banks below the diagonal in Table 13 rose to 175 at year-end, compared with 87 a year earlier) may portend a further increase in failures of agricultural banks.

TABLE 11.—BANKS AT WHICH NONPERFORMING LOANS EXCEEDED TOTAL CAPITAL DECEMBER 31

State	Number of banks			As percentage of all banks in State, 1984	Farm loans at these banks, 1984	
	1982	1983	1984		Millions of dollars	As percentage of total loans at these banks
United States	148	162	210	1	908	15
Arkansas	1	4	3	1	15	31
California	21	13	11	3	16	3
Colorado	5	4	12	3	36	20
Florida	3	4	4	1	2	1
Illinois	18	13	6	(¹)	8	8
Indiana	4	5	6	2	16	13
Iowa	0	5	20	3	170	42
Kansas	2	5	17	3	116	48
Kentucky	0	4	3	1	7	13
Louisiana	3	6	7	2	12	4
Michigan	3	3	1	*	4	27
Minnesota	7	7	13	2	60	40
Missouri	7	4	7	1	58	22
Montana	4	3	7	4	45	27
Nebraska	5	5	11	2	77	68
New Jersey	6	1	2	2	5	1
North Dakota	1	1	3	2	40	48
Oklahoma	3	11	14	3	46	6
Oregon	14	9	9	12	45	21
Tennessee	11	21	9	3	9	4
Texas	2	8	16	1	16	3
Utah	4	4	6	10	6	4
West Virginia	0	4	2	1	(¹)	1
Wisconsin	3	4	5	1	33	42
Wyoming	1	3	4	3	8	13

¹ Less than 0.5 percent.

Data are shown for states that accounted for at least 1 percent of the national total of such banks in 1984 or at least 2 percent of the total in 1982 or 1983.

Table 12

Small nonagricultural banks, by ratios of capital to assets and nonperforming loans to assets

Nonperforming loans as a percentage of total assets	Capital as a percentage of total assets						
	Under 3.0	3.0 to 5.9	6.0 to 8.9	9.0 to 11.9	12.0 to 14.9	15.0 to 17.9	18.0 and over
			December 31, 1982				
Under 3.0..........	3	188	4270	2398	518	171	348
3.0 to 5.9.........	2	29	408	231	44	11	13
6.0 to 8.9.........	3	23	72	44	6	3	4
9.0 to 11.9........		7	16	6	4	1	2
12.0 to 14.9.......	1	3	4	6	3		
15.0 to 17.9.......			5	2			
18.0 and over......	2	2	2		1		
			December 31, 1983				
Under 3.0..........	9	236	4459	2214	527	211	326
3.0 to 5.9.........	5	41	379	202	35	8	6
6.0 to 8.9.........	8	11	54	33	8	3	2
9.0 to 11.9........	1	7	22	2	4	1	
12.0 to 14.9.......	3	2	6	4		1	
15.0 to 17.9.......	1		4	3	2		
18.0 and over......			5	1	3		
			December 31, 1984				
Under 3.0..........	5	205	4543	2191	512	227	345
3.0 to 5.9.........	4	43	412	181	43	12	14
6.0 to 8.9.........	2	12	83	35	6	4	2
9.0 to 11.9........		9	24	11	3	1	3
12.0 to 14.9.......	1	4	7	1			1
15.0 to 17.9.......			1				1
18.0 and over......		1	2	1	1		

Table 13

Agricultural banks, by ratios of capital to assets and nonperforming loans to assets

Nonperforming loans as a percentage of total assets	Capital as a percentage of total assets						
	Under 3.0	3.0 to 5.9	6.0 to 8.9	9.0 to 11.9	12.0 to 14.9	15.0 to 17.9	18.0 and over
			December 31, 1982				
Under 3.0..........	1	18	1979	2006	483	122	68
3.0 to 5.9.........		7	206	162	31	5	3
6.0 to 8.9.........		5	20	18	3		
9.0 to 11.9........			5	8	1		
12.0 to 14.9.......			2	1			
15.0 to 17.9.......					1		
18.0 and over......		1					
			December 31, 1983				
Under 3.0..........		24	1778	1936	536	129	68
3.0 to 5.9.........		11	242	188	61	12	4
6.0 to 8.9.........	1	4	40	36	8	1	
9.0 to 11.9........		3	10	4	5		
12.0 to 14.9.......		1	6	3	1		
15.0 to 17.9.......			2		1		
18.0 and over......							
			December 31, 1984				
Under 3.0..........		17	1550	1738	531	137	90
3.0 to 5.9.........	2	9	292	290	64	13	5
6.0 to 8.9.........	2	5	83	60	12		2
9.0 to 11.9........	4	5	21	18	5		
12.0 to 14.9.......	1	2	5	3	4		
15.0 to 17.9.......		1	3	5			
18.0 and over......		1		1			

TABLE 14.—FARM LOANS AT INSURED COMMERCIAL BANKS THAT FAILED IN 1984

Sequence number[1]	Month	State	Farm loans, Dec. 31, 1983 — Millions of dollars	Farm loans, Dec. 31, 1983 — Percentage of total loans at bank
1	1	TN	[1] 2	[1] 6
2	1	TN	1	5
3	1	KS	0	1
4	2	WV	0	1
5	2	OR	0	0
6	2	IL	[1] 2	[1] 35
7	2	CA	0	0
8	2	TX	6	28
9	3	OR	0	0
10	3	FL	0	0
11	3	MI	1	2
12	3	TX	8	26
13	3	CA	1	1
14	4	TN	0	1
15	4	TN	0	1
16	4	TX	1	3
17	4	IN	5	11
18	4	KY	8	55
19	4	IL	0	0
20	4	TN	2	15
21	4	CA	0	0
22	5	WY	0	2
23	5	NY	0	0
24	5	MN	10	57
25	5	TX	0	0
26	5	CA	0	1
27	5	MS	2	1
28	5	OK	0	0
29	5	TN	1	13
30	5	LA	3	6
31	5	IL	0	0
32	5	CA	0	0
33	5	MN	0	0
34	6	CA	0	0
35	6	AL	5	20
36	6	OR	0	4
37	6	TN	1	4
38	6	SD	0	17
39	6	AR	16	61
40	6	MO	0	1
41	6	IA	9	66
42	6	TN	7	27
43	6	TX	2	2
44	7	IL	1	14
45	7	MN	2	8
46	7	TN	1	8
47	8	AR	3	21
48	8	IN	2	20
49	8	IA	9	73
50	8	TX	6	60
51	8	PR	1	0
52	8	KS	2	24
53	8	CO	1	68
54	8	OR	0	0
55	9	NE	8	61
56	9	IA	10	59
57	9	OK	0	0
58	9	NE	7	68
59	9	FL	0	0

TABLE 14.—FARM LOANS AT INSURED COMMERCIAL BANKS THAT FAILED IN 1984—Continued

Sequence number	Month	State	Farm loans, Dec. 31, 1983	
			Millions of dollars	Percentage of total loans at bank
60	9	OK	14	36
61	10	OK	0	2
62	10	KS	1	58
63	10	MO	6	51
64	10	TN	0	2
65	10	OK	3	22
66	10	NE	3	63
67	10	NE	5	62
68	10	MN	2	43
69	10	KS	3	51
70	11	OR	1	4
71	11	KS	1	36
72	11	TN	2	6
73	11	UT	1	19
74	12	CO	2	60
75	12	KS	0	2
76	12	NE	2	48
77	12	KS	6	65
78	12	IL	1	5
All banks that failed			199	10

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[1] Data as of September 30, 1983.

APPENDIX

INTRODUCTION TO DATA ON FARM LOAN LOSSES AND DELINQUENCIES (SECTIONS A, B, AND C)

Starting in 1984, most banks involved in farm lending report charge-offs and recoveries on farm loans. Also, starting in December 1982, these banks report the amount of farm loans past due 30 days or more and still accruing interest. However, only the large banks significantly involved in farm lending report the amount of nonaccrual farm loans—those more seriously delinquent loans for which repayment in full is not expected.

Although data on farm loan experience are thus incomplete in a rather crucial way, for many analytical purposes it is equally or more important to examine the overall loan experience at those banks heavily involved in farm lending. For this approach, the data on loan losses and delinquencies are complete, as all banks report total charge-offs as well as total past due and nonaccrual loans. These data for total loans are examined and used in sections D and E. Sections A, B, and C present the partial data for farm loans.

Two farm loan items are reported by all banks and defined in the same manner for each bank: the amounts of farm real estate loans and of farm non-real-estate loans outstanding at the end of each quarter. Other data—average "agricultural loans" outstanding during the quarter, delinquent farm loans, and charge-offs on the farm loans—are neither reported by all banks nor defined in the same way for each bank. The differences are summarized in the next page.

For large banks, all data are for farm non-real-estate loans. For smaller banks, however, the data charge-offs and delinquent loans are for "agricultural loans" as defined by each bank for its own internal accounting. Nevertheless, these data for large and small banks have been aggregated in sections A and B because, at most banks, the amount of "agricultural loans" reported is fairly close to that of farm non-real-estate loans.

The proportion of bank farm lending covered by the banks reporting farm loan charge-offs and delinquencies varies among areas, and the relative coverage should be noted by users of the regional data. In section A to C, the "percentage of area total" is the reporting banks' share of the total outstanding farm non-real-estate loans at all banks in the area.

To provide a convenient indication of the relative importance of each region, the amount of "farm loans" is also shown in each table. This is the amount used in calculating the ratios shown for December 31, 1984; as already noted, it is a mixture of farm non-real-estate loans and "agricultural loans." Therefore, this figure does not represent the amount of farm loans at banks in the region. And, as indicated in the preceding paragraph, this mixed amount was not used in computing the "percentage of area total" shown in the next column.

Categories of banks reporting farm loan items:

Group A.—Banks with foreign offices and other banks with total assets of $300 million or more.

Group B.—Subset of Group A that reported average farm non-real-estate loans (required if such loans at end of quarter exceeded 5 percent of total loans in domestic offices).

Group C.—Banks with total assets of $25 million or more but less than $300 million that reported average "agricultural loans" (required if farm non-real-estate loans at end of quarter exceeded 5 percent of total loans).

Group D.—Subset of Group C with total assets of $100 million or more but less than $300 million.

Group E.—Banks with total assets under $25 million at which farm non-real-estate loans at end of quarter exceeded 5 percent of total loans.

Group F.—All other banks.

Item	*Banks reporting*
Outstanding loans:	
End of quarter:	
Farm real estate loans	A B C D E F
Farm non-real-estate loans	A B C D E F
Average during quarter:	
Farm non-real-estate loans	B
"Agricultural loans"	C D
Charge-offs and recoveries:	
Farm non-real-estate loans	A B
"Agricultural loans"	C E
Delinquent loans:	
Farm non-real-estate loans:	
Past due but still accruing interest	B
Nonaccrual and renegotiated	B
"Agricultural loans:"	
Past due but still accruing interest	C D E
Nonaccrual and renegotiated	D

Data for December 31, 1984, are based on reports available to analysts as of March 8, 1985, when over 99 percent of banks had reported but regular editing was not complete. Special editing procedures were used in compiling these data and generally only ratios, rather than aggregates, are shown.

TABLE A.1.1.—NET CHARGE-OFFS OF FARM LOANS IN 1984 AS A PERCENTAGE OF FARM LOANS OUTSTANDING AT YEAR-END

Area	Net charge-offs of farm loans as percentage of farm loans outstanding	Addendum: Farm loans reported	
		Billions of dollars	Percentage of area total
United States	2.2	38.6	92
Alabama	2.7	.2	68
Arizona	.5	.6	99
Arkansas	1.1	.5	86
California	6.1	3.9	99
Colorado	1.7	.8	93
Delaware	.0	.1	96
Florida	.4	.2	79
Georgia	2.3	.2	72
Idaho	.8	.6	100
Illinois	1.9	2.7	93
Indiana	1.2	1.3	92
Iowa	2.9	3.9	96

TABLE A.1.1.—NET CHARGE-OFFS OF FARM LOANS IN 1984 AS A PERCENTAGE OF FARM LOANS OUTSTANDING AT YEAR-END—Continued

Area	Net charge-offs of farm loans as percentage of farm loans outstanding	Addendum: Farm loans reported	
		Billions of dollars	Percentage of area total
Kansas	2.1	2.3	91
Kentucky	1.1	.8	91
Louisiana	1.4	.3	86
Maryland	1.0	.1	75
Michigan	.9	.5	85
Minnesota	2.3	2.3	92
Mississippi	1.5	.4	90
Missouri	3.0	1.5	91
Montana	1.1	.7	93
Nebraska	2.5	3.0	96
New Mexico	1.0	.2	87
New York	1.6	.7	94
North Carolina	.8	.3	95
North Dakota	1.6	.9	93
Ohio	1.8	.6	82
Oklahoma	1.9	1.2	90
Oregon	1.1	.3	95
Pennsylvania	1.4	.3	81
South Carolina	1.1	.1	83
South Dakota	1.9	1.4	97
Tennessee	1.5	.3	75
Texas	1.3	2.8	89
Utah	.1	.1	87
Virginia	.3	.2	81
Washington	.6	.7	96
West Virginia	1.1	.0	32
Wisconsin	.9	1.3	88
Wyoming	1.5	.3	95
Addendum:			
California	6.1	3.9	99
Other States	1.8	34.7	92

TABLE A.1.2.—NET CHARGE-OFFS OF FARM LOANS IN 1984 AS A PERCENTAGE OF FARM LOANS OUTSTANDING AT YEAR-END

Federal Reserve District	Net charge-offs of farm loans as percentage of farm loans outstanding	Addendum: Farm loans reported	
		Billions of dollars	Percentage of area total
United States	2.2	38.6	92
1. Boston	1.6	.1	77
2. New York	1.6	.7	93
3. Philadelphia	1.2	.4	83
4. Cleveland	1.5	1.0	85
5. Richmond	.7	.6	84
6. Atlanta	1.5	1.1	75
7. Chicago	2.1	8.4	93
8. St. Louis	1.7	3.0	89
9. Minneapolis	1.9	5.6	94
10. Kansas City	2.3	8.4	93
11. Dallas	1.3	3.1	88
12. San Francisco	4.0	6.2	98

TABLE. B.1.1.—FARM LOANS PAST DUE AND STILL ACCRUING INTEREST AS A PERCENTAGE OF FARM LOANS OUTSTANDING DEC. 31, 1984

Area	Total	Past due 30 to 89 days and still accruing	Past due 90 days and more and still accruing	Addendum: Farm loans reported	
				Billions of dollars	Percentage of area total
United States	3.8	2.6	1.2	37.6	90
Alabama	3.5	2.4	1.1	.2	61
Arizona	2.2	1.7	.5	.5	97
Arkansas	4.4	3.3	1.1	.5	86
California	4.9	3.3	1.5	3.9	98
Colorado	5.1	3.5	1.6	.8	93
Delaware	.3	.3	.0	.0	25
Florida	3.5	2.4	1.0	.2	62
Georgia	5.0	3.5	1.4	.2	70
Idaho	4.0	3.2	.8	.6	100
Illinois	2.6	1.6	1.1	2.7	92
Indiana	3.1	1.7	1.3	1.2	88
Iowa	3.5	2.3	1.2	3.9	96
Kansas	2.9	1.9	1.0	2.3	91
Kentucky	2.7	1.6	1.1	.8	91
Louisiana	6.7	5.9	.8	.3	83
Maryland	2.0	1.8	.2	.1	72
Michigan	3.8	2.2	1.5	1.5	78
Minnesota	4.3	2.8	1.5	2.3	92
Mississippi	4.8	3.0	1.8	.4	90
Missouri	5.0	3.4	1.5	1.5	91
Montana	7.5	5.7	1.8	.7	93
Nebraska	2.4	1.5	.9	3.0	96
New Mexico	3.1	2.5	.6	.2	79
New York	1.7	1.0	.7	.4	58
North Carolina	3.9	3.2	.7	.2	65
North Dakota	5.4	4.1	1.3	.9	93
Ohio	3.6	1.9	1.7	.6	81
Oklahoma	3.5	2.3	1.1	1.1	88
Oregon	6.5	4.1	2.4	.3	94
Pennsylvania	3.4	2.7	.8	.3	71
South Carolina	3.0	2.3	.7	.1	65
South Dakota	4.7	3.5	1.2	1.4	97
Tennessee	4.3	3.3	1.1	.3	74
Texas	2.3	1.4	.8	2.7	86
Utah	8.1	6.6	1.5	.1	74
Virginia	4.4	3.6	.8	.2	80
Washington	6.2	5.4	.8	.7	95
West Virginia	4.7	3.0	1.7	.0	32
Wisconsin	4.6	2.3	2.3	1.3	88
Wyoming	5.9	4.6	1.3	.3	95

TABLE B.2.—FARM PRODUCTION LOANS PAST DUE 30 DAYS OR MORE AS A PERCENTAGE OF TOTAL FARM PRODUCTION LOANS DEC. 31

Area	1982	1983	1984
United States	3.8	3.7	3.8
Alabama	7.2	4.3	3.5
Arizona	4.6	2.4	2.2
Arkansas	5.0	4.2	4.4
California	8.8	9.0	4.9
Colorado	3.2	3.9	5.1
Delaware	1.9	.3	.3
Florida	3.7	8.2	3.5

TABLE B.2.—FARM PRODUCTION LOANS PAST DUE 30 DAYS OR MORE AS A PERCENTAGE OF TOTAL FARM PRODUCTION LOANS DEC. 31—Continued

Area	1982	1983	1984
Georgia	6.1	6.1	5.0
Idaho	3.8	2.4	4.0
Illinois	2.1	1.9	2.6
Indiana	2.7	3.1	3.1
Iowa	2.2	2.6	3.5
Kansas	1.9	2.5	2.9
Kentucky	3.1	2.9	2.7
Louisiana	8.6	6.5	6.7
Maryland	2.9	2.3	2.0
Michigan	2.6	3.1	3.8
Minnesota	3.4	3.5	4.3
Mississippi	5.2	3.8	4.8
Missouri	3.3	3.2	5.0
Montana	5.4	5.5	7.5
Nebraska	1.9	2.3	2.4
New Mexico	3.8	2.9	3.1
New York	1.0	1.6	1.7
North Carolina	3.4	4.0	3.9
North Dakota	4.9	5.5	5.4
Ohio	3.2	2.6	3.6
Oklahoma	1.9	2.2	3.5
Oregon	11.9	6.1	6.5
Pennsylvania	5.5	4.1	3.4
South Carolina	4.5	4.0	3.0
South Dakota	3.2	2.6	4.7
Tennessee	4.8	5.1	4.3
Texas	3.0	1.9	2.3
Utah	6.0	5.9	8.1
Virginia	2.0	2.1	4.4
Washington	5.7	3.2	6.2
West Virginia	1.9	3.3	4.7
Wisconsin	3.7	3.9	4.6
Wyoming	5.1	2.3	5.9

TABLE C.1.—DELINQUENT FARM LOANS AS A PERCENTAGE OF FARM LOANS OUTSTANDING LARGE COMMERCIAL BANKS DEC. 31, 1984

Area	Total	Past due 30 to 89 days and still accruing	Past due 90 days or more and still accruing	Nonaccrual	Addendum. Farm loans reported	
					Millions of dollars	Percentage of area total
United States	10.1	3.1	1.1	5.8	12,669	31
Alabama	8.3	2.2	.7	5.4	28	12
Arizona	12.0	1.7	.5	9.8	536	96
Arkansas	6.4	3.2	.5	2.3	84	17
California	13.1	3.3	1.4	8.4	3,781	96
Colorado	18.2	4.3	1.5	10.4	256	29
Delaware	.3	.3	.0	.0	18	25
Florida	5.6	2.7	1.0	1.9	94	36
Idaho	5.7	2.8	.5	2.4	485	79
Illinois	5.8	1.4	.8	3.0	453	15
Indiana	5.1	1.9	.7	2.4	340	25
Iowa	9.6	3.1	1.0	5.3	482	12
Kentucky	4.2	1.0	.4	2.7	285	39
Louisiana	9.3	8.5	.2	.6	82	21
Michigan	9.7	1.5	1.1	7.0	168	29
Minnesota	21.7	4.8	1.9	14.5	270	10

TABLE C.1.—DELINQUENT FARM LOANS AS A PERCENTAGE OF FARM LOANS OUTSTANDING LARGE COMMERCIAL BANKS DEC. 31, 1984—Continued

Area	Total	Past due 30 to 89 days and still accruing	Past due 90 days or more and still accruing	Nonaccrual	Addendum: Farm loans reported	
					Millions of dollars	Percentage of area total
Mississippi	6.0	2.4	1.2	2.3	148	33
Missouri	19.3	6.9	2.0	9.7	167	11
Montana	15.3	6.0	1.1	7.4	164	23
Nebraska	6.8	1.2	.9	4.5	520	17
New Mexico	8.3	3.8	.1	4.5	87	39
New York	2.9	.7	.5	1.7	347	49
North Carolina	5.8	3.2	.8	1.7	166	56
North Dakota	7.0	2.5	1.7	2.7	126	12
Ohio	12.0	1.9	1.5	8.1	232	36
Oklahoma	7.2	4.1	1.0	2.1	263	21
Oregon	10.4	4.2	2.4	3.7	288	81
Pennsylvania	7.2	2.7	.6	3.6	211	57
South Carolina	4.4	.4	.2	3.8	36	37
South Dakota	14.0	5.4	1.4	7.0	560	39
Tennessee	3.7	1.5	.6	1.5	110	30
Texas	4.9	1.5	1.1	2.3	825	27
Utah	11.4	6.2	1.5	3.7	59	57
Virginia	6.0	5.0	.1	.8	120	53
Washington	10.6	5.5	.8	3.8	575	79
Addendum:						
California	13.1	3.3	1.4	8.4	3,781	96
Other states	8.9	3.0	1.0	4.7	8,888	25

Data are from banks with total assets of $100 million or more. Total includes renegotiated "troubled" debt.

TABLE C.2.—DELINQUENT FARM LOANS AS A PERCENTAGE OF FARM LOANS OUTSTANDING

[Large commercial banks Dec. 31]

Area	1982	1983	1984
United States	10.4	11.0	10.1
Alabama	22.0	13.5	8.3
Arizona	11.9	13.2	12.0
Arkansas	6.6	9.4	6.4
California	15.0	19.1	13.1
Colorado	5.3	12.5	18.2
Delaware	.0	.0	.3
Florida	6.3	16.4	5.6
Idaho	4.9	4.2	5.7
Illinois	4.2	5.0	5.8
Indiana	5.3	6.2	5.1
Iowa	5.4	7.1	9.6
Kentucky	5.5	4.4	4.2
Louisiana	11.6	14.0	9.3
Michigan	4.0	5.3	9.7
Minnesota	14.2	11.1	21.7
Mississippi	17.0	5.2	6.0
Missouri	6.8	5.3	19.3
Montana	8.2	9.6	15.3
Nebraska	4.7	6.3	6.8
New Mexico	8.5	8.3	8.3
New York	.7	2.8	2.9
North Carolina	4.0	4.1	5.8
North Dakota	7.8	10.1	7.0
Ohio	13.8	10.1	12.0
Oklahoma	2.4	3.1	7.2
Oregon	15.9	9.2	10.4

TABLE C.2.—DELINQUENT FARM LOANS AS A PERCENTAGE OF FARM LOANS OUTSTANDING—Continued

[Large commercial banks Dec. 31]

Area	1982	1983	1984
Pennsylvania	10.6	11.8	7.2
South Carolina	6.6	8.1	4.4
South Dakota	9.0	9.1	14.0
Tennessee	7.0	7.9	3.7
Texas	8.6	4.2	4.9
Utah	19.8	9.1	11.4
Virginia	1.2	2.6	6.0
Washington	9.8	5.8	10.6
Addendum:			
California	15.0	19.1	13.1
Other states	7.9	7.1	8.9

Data are from banks with total assets of $100 million or more.

TABLE D.1.—PAST DUE, NONACCRUAL, AND RENEGOTIATED LOANS AS A PERCENTAGE OF TOTAL LOANS

[Insured commercial banks Dec. 31, 1984]

Banks by size and by farm loan ratio	Past due 30 to 89 days and still accruing	Past due 90 days or more and still accruing	Nonaccrual	Renegotiated "troubled" debt	Total
Agricultural banks	2.6	1.4	2.0	0.2	6.2
Other small banks	2.4	.9	1.2	.2	4.7
Banks with total assets under $500 million:					
Farm loans as percentage of total loans at bank:					
Under 1	2.3	.9	1.1	.1	4.4
1 to 4	2.4	1.0	1.2	.2	4.7
5 to 9	2.6	1.1	1.2	.1	5.0
10 to 14	2.7	1.2	1.5	.2	5.6
15 to 19	2.8	1.4	1.7	.2	6.0
20 to 24	2.8	1.3	1.6	.2	5.9
25 to 29	2.8	1.6	1.9	.2	6.5
30 to 34	2.5	1.5	1.8	.2	6.0
35 to 39	2.7	1.6	1.8	.2	6.2
40 to 44	2.5	1.4	2.1	.2	6.4
45 to 49	2.7	1.7	2.2	.2	6.5
50 to 54	2.5	1.5	2.0	.2	6.4
55 to 59	2.2	1.3	2.3	.1	6.1
60 to 64	2.3	1.3	2.7	.2	6.5
65 to 69	2.1	1.2	2.5	.2	6.0
70 to 74	2.4	1.6	2.4	.1	6.3
75 to 79	1.9	1.2	2.0	.1	5.2
80 and over	1.7	.9	2.8	.1	5.4

TABLE D.2.—TOTAL PAST DUE, NONACCRUAL, AND RENEGOTIATED LOANS AS A PERCENTAGE OF TOTAL LOANS

[Insured commercial banks Dec. 31]

Banks by size and by farm loan ratio	1982	1983	1984
Agricultural banks	4.9	5.2	6.2
Other small banks	5.2	4.6	4.7
Banks with total assets under $500 million:			
Farm loans as percentage of total loans at bank:			
Under 1	5.4	4.5	4.4
1 to 4	4.9	4.6	4.7
5 to 9	5.1	5.0	5.0
10 to 14	5.4	5.1	5.6
15 to 19	5.4	5.5	6.0
20 to 24	5.5	5.5	5.9
25 to 29	5.0	5.4	6.5
30 to 34	5.2	5.4	6.0
35 to 39	5.1	5.5	6.2
40 to 44	5.0	5.8	6.4
45 to 49	4.8	5.0	6.5
50 to 54	4.7	5.7	6.4
55 to 59	4.0	4.6	6.1
60 to 64	3.8	4.9	6.5
65 to 69	4.2	4.6	6.0
70 to 74	3.4	4.3	6.3
75 to 79	3.3	4.6	5.2
80 and over	2.4	3.6	5.4

TABLE E.4.—PERCENTAGE DISTRIBUTION OF AGRICULTURAL BANKS BY ANNUAL PROVISION FOR LOAN AND LEASE LOSSES

Provision for loan losses as percentage of loans at bank	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
All banks	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Under 0.10	49.0	50.3	54.0	51.4	47.7	49.4	43.9	48.5	40.8	35.7	31.0	29.6	23.4	20.3	14.4
0.10 to 0.39	27.5	27.7	27.2	27.4	29.4	29.9	33.9	30.2	35.8	39.1	34.9	30.1	24.5	21.6	16.9
0.40 to 0.69	13.5	13.3	12.1	13.7	14.0	13.1	13.8	12.6	13.2	14.5	17.5	19.1	18.5	16.6	15.3
0.70 to 0.99	4.6	3.7	3.0	3.9	3.8	3.6	3.6	3.8	4.4	5.3	6.8	7.4	10.5	11.6	11.7
1.00 to 1.29	1.9	2.0	1.2	1.6	2.0	1.6	1.9	1.9	2.2	2.0	3.7	4.7	6.8	7.8	8.6
1.30 to 1.59	1.1	.9	.9	.8	.9	.7	1.1	1.2	1.3	1.3	1.7	2.4	4.2	4.9	5.8
1.60 to 1.89	.8	.6	.6	.4	.8	.5	.4	.5	.7	6	1.1	1.7	2.9	3.6	4.5
1.90 to 2.19	.5	.5	.3	.3	.5	.3	.4	.4	.3	.5	.9	1.4	2.1	2.7	3.7
2.20 to 2.49	.1	.1	.2	.1	.1	.1	.1	.2	.3	.3	.5	.8	1.5	2.1	2.4
2.50 to 4.99	.8	.6	.2	.3	.6	.6	.6	.5	.8	.5	1.5	2.2	4.2	5.9	10.5
5.00 to 7.49	.1	.0	.1	.1	.2	.1	.1	.1	.1	.2	.2	.4	.8	1.5	3.3
7.50 and over	.1	.2	.1	.0	.1	.1	.1	.1	.1	.1	.2	.2	.5	1.4	2.8

Agricultural banks are banks with an above-average farm loan ratio; that is, banks at which the ratio of farm loans to total loans is above the average of such ratios at all banks on the date specified (16.99 percent on December 31, 1984). Farm loans are loans secured by farm real estate, loans to finance agricultural production, and other loans to farmers.

Banks are classified according to the ratio of the annual provision for loan and lease losses to the total loans and lease financing receivables outstanding on December 31.

TABLE E.5.—PERCENTAGE DISTRIBUTION OF AGRICULTURAL BANKS BY RATE OF RETURN TO EQUITY

Net Income as percentage of average equity at bank	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
All banks	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Negative	1	1	1	0	1	2	1	1	1	1	1	2	4	7	12
0 to 4	5	5	6	2	2	5	4	4	3	2	2	3	5	7	9
5 to 19	24	26	28	12	12	16	14	16	14	8	9	12	15	18	23
10 to 14	43	41	43	39	35	38	41	45	46	36	33	33	33	36	36
15 to 19	21	20	18	33	34	29	30	28	28	38	35	32	28	24	15
20 to 24	5	4	4	10	12	9	8	5	6	12	14	13	11	7	3
25 and over	2	2	1	4	4	2	2	1	1	3	5	6	4	2	1

Agricultural banks are banks with an above-average farm loan ratio; that is, banks at which the ratio of farm loans to total loans is above the average of such ratios at all banks on the date specified (16.99 percent on December 31, 1984). Farm loans are loans secured by farm real estate, loans to finance agricultural production, and other loans to farmers.

Banks are classified according to the ratio of net income after taxes to the average of total equity capital (including notes and debentures subordinated to deposits) at the beginning and end of the year.

STATEMENT OF DR. GEORGE D. IRWIN, ASSOCIATE DEPUTY GOVERNOR AND CHIEF ECONOMIST, THE FARM CREDIT ADMINISTRATION

Mr. Chairman, members of the Committee, I am honored to appear today on behalf of the Farm Credit Administration as a participant on this panel to discuss the instruments of public policy regarding investment, debt, credit, and taxes in agriculture. My statement will be brief in the interest of preserving time for discussion.[1]

Credit facilitates the accomplishment of changes that are caused by more basic economic, social, and political forces. But, credit itself is not a primary cause of adjustments. Government programs, directly and indirectly, influence the pattern of forces in the private sector. Further, only a part of these Government influences comes from areas under the direct jurisdiction of USDA. Thus all of the actions of the Congress in economic policy—international, monetary, fiscal, tax, as well as the 1985 Farm Bill—are major instruments of public policy affecting agriculture. Credit programs can facilitate the implementation of such policies in the course of performing a legitimate economic function.

For the longer term, the effective way for Government to influence the course of the agricultural sector is by modifying these basic forces and not by compromising the functioning of the credit delivery system. Government and commercial lenders, including the Farm Credit system, have parallel roles in "soft credit" and in "sound credit." There are important linkages between the public and private sectors, because the ultimate goal of Government credit programs is to provide temporary assistance and transition into the private sector. Government programs provide legitimate, subsidized entry opportunities for individuals who present too great a risk to commercial lenders, when such entry is considered socially desirable. Or they bridge a temporary period of excessive risk faced by established producers, due to uncontrollable natural or economic disasters.

Credit and substitutes for credit have been provided by Government in large amounts, largely as a by-product through operation of the commodity price support programs. Nonrecourse loan credit often substitutes directly for borrowing from commercial lenders. There may be opportunities to redesign programs to shift some of this financing to the commercial sector, and to adjust Government lending terms to make the commercial lending sector more competitive.

In the shorter term, FCA believes that the tools of public policy, including some credit tools, should be utilized to ease the fundamental adjustment that is now taking place in agriculture. Agriculture is suffering a painful adjustment following rapid growth in the 1970s. In previous sessions you have reviewed the indicators and causes of this adjustment. They are briefly, the contraction in export markets, farm profits, land values, and continued high interest rates. We came into the 1980s from a period when inflation was high, farm incomes reached records, and land values were escalating. Economic policy instruments used to control inflation have focused the pain of adjustment on the farmer and other export sectors while much of the rest of the economy experienced the benefits of a surge in prosperity.

This contrast between the 1970s and 1980s overlays a long-term adjustment pattern tracing back more than 50 years. The trends include attrition in farm numbers, farm size enlargement, regional relocations of agricultural production, and a growing interdependence between farming and rest of the U.S. and world economies.

The seriousness of the immediate plight of agriculture prompted the Federal Farm Credit Board to adopt at its last meeting a Resolution for Dealing With Stress in Agriculture. That resolution commits the Farm Credit Administration to work with the Administration and Congress in fashioning appropriate remedies. It also contains specific directions for further consideration and exploration with policy makers. We would be pleased to discuss these specific recommendations with you at the appropriate time.

In addition, we have submitted extensive recommendations to Secretary Block both on desired modifications to the Debt Adjustment Program in the short run, and other ways to improve cooperation between the Farm Credit System and FmHA in the interest of improving credit service to agriculture.

Finally, I must address myself to two points of immediate concern that deserve clarification.

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[1] For elaboration and detail on many of the points in this statement, I respectfully direct your attention to a paper we submitted to your Committee in April of last year. It appears on pages 183 through 191 of the full Committee's print titled, "Farm Policy Perspectives: Setting the Stage for 1985 Agricultural Legislation."

First, the financial institutions of the Farm Credit System as a whole are sound. Despite present adversity, record levels of loan losses, and growing numbers of nonperforming loan assets, these institutions have sufficient reserves prudently built up over the decades to deal with the current problem. The immediate problem is creating the mechanisms to assure that this capital and reserves can be utilized effectively. However, given the distinct possibility that the adversity affecting agriculture will continue for some time into the future, both the FCA and the Farm Credit System are evaluating possible measures to insure that the cooperative Farm Credit System will be able to continue to provide a reliable private sector source of sound, adequate and constructive credit, through continued access to national financial markets, to rural America in the decades ahead.

Second, we have seen a tendency to view farm sector relief efforts as nothing more than "bank bailouts." This is only incidental to the purpose of such programs. The cooperative Farm Credit System is owned by the farmers who borrow from it and its losses are their losses. Further, we need to preserve the cooperative mechanism for serving farmers who will survive the present adjustment in agriculture. These objectives cannot fairly be characterized as a "bank bailout" that will line the pockets of a few wealthy stockholders. Rather, such efforts will inure solely to the benefit of current and future farmer borrower/owners of the Farm Credit System. The process will not necessarily mean all entities in the current Farm Credit System are guaranteed survival.

Once again, thank you for inviting our participation in today's hearing. We are hopeful that our comments and the discussions that will ensue are helpful to you as you undertake the tremendous responsibility of writing the 1985 Farm Bill.

MAY 1 HEARING—CRITICAL ANALYSIS OF AGRICULTURAL POLICY OPTIONS

STATEMENT OF HON. JESSE HELMS, A U.S. SENATOR FROM NORTH CAROLINA

This hearing is the last in a series of thematic hearings on the 1985 Farm Bill. In the first four hearings we covered the structure of agriculture; loan rates, target prices, production controls and supply management; research and technology; and credit; debt, and investment in agriculture.

Since the last thematic hearing on March 20, the Committee has held 13 hearings on the farm bill at the full Committee level. The purpose of which has been to hear from farmers, taxpayers, farm groups, members of Congress, and others who wanted to comment on the Farm Bill. In addition, members of this Committee have conducted field hearings in various parts of the country. I trust that everyone has been offered the opportunity to testify, and that all have done so, or submitted written testimony for the record.

The purpose of this hearing is to consider what has been covered thus far, and to see if we have reached any conclusions about these areas that members of the Committee should consider as we begin mark-up on the Farm Bill next week.

As we approach the mark-up, the Committee has before it a number of bills which differ in certain aspects of their approach. All of these bills provide for the continuation of loan rates, although with different variations. Almost all of these bill provide that loan rates would be set in relation to an average market price, and would be lower than present loan rates. Several bills retain the current target price mechanism, one uses a marketing loan, and another uses transition payments instead of target prices.

It will be exceedingly difficult for the Committee to consider the various options and to structure a Farm Bill that meets the needs of American agriculture—unless we have a clear set of goals. Without agreement on the objectives of the bill, we will undoubtedly have a difficult time constructing a farm bill that makes sense.

We are pleased to have with us today a distinguished panel of three eminent agricultural economists. Each of these gentlemen has a different vantage point from which to look at agriculture in the United States and in the world. Each has made outstanding contributions to agriculture during his career.

We are hopeful that your analysis of the agricultural sector, as well as your comments on the appropriate course for the Farm Bill, will help us to make correct choices in policy and to better identify our goals.

We welcome each of you to Washington, and appreciate your taking time to be with us today.

STATEMENT OF HON. EDWARD ZORINSKY, A U.S. SENATOR FROM NEBRASKA

Mr. Chairman, today's hearing will be the last in a series of hearings on the issues that must be addressed by the 1985 farm bill. As early as next week, the Committee may begin to markup the various farm bills that will have been introduced.

During the hearing process, witnesses representing a wide variety of interests presented testimony on the commodity programs, soil and water resource conservation, rural credit, research and technology, and other issues that are of vital importance to America's farmers.

Shortly, I will be introducing my version of the 1985 farm bill. That bill is the product of many hours of work and careful study of the suggestions and comments made during the farm bill hearings—including two field hearings that I conducted in Nebraska.

However, I am prepared to consider modifications or refinements of the bill. I expect to support and offer appropriate amendments during the markup of the 1985 farm bill.

Whatever farm legislation the Committee chooses to report, it is important that it address the problems of depressed farm income, dwindling exports, surplus production, the erosion of our farmland, and the high cost and mismanagement of current programs.

A farm bill is needed to resolve these issues and reverse the policies of the administration that have caused the depression in the rural economy.

If our Nation's farmers are treated fairly under the 1985 farm bill, improvements will be made in the agricultural economy. I am convinced that a healthy agricultural economy will provide the essential foundation for our Nation's long-term prosperity.

I look forward to reviewing the testimony of today's witnesses.

STATEMENT OF HON. ALAN J. DIXON, A U.S. SENATOR FROM ILLINOIS

Mr. Chairman, this is the final hearing on the 1985 farm bill. Next week, we will begin markup on the 1985 farm bill. It is again important to stress the significance of the agricultural sector of our nation.

Our farmers have been harmed by a number of factors, including a strong dollar, high real interest rates and a huge federal deficit.

It is vital that we, as members of the Senate Agriculture Committee, examine all proposals closely as we craft the 1985 farm bill. We now have the opportunity to shape and strengthen the future of agriculture.

Thank you, Mr. Chairman.

STATEMENT OF JOHN A. SCHNITTKER

Mr. Chairman: I wish to thank you for the invitation to appear today to comment on farm bill proposals in the context of the very difficult situation American agriculture faces in the next few years, and the financial plight of thousands of farm families. I have set down what I consider to be a fairly practical course of action for the principal commodities, consistent with the needs of the farm sector and the federal budget.

Grains and soybeans along with dairy products, cotton, and rice are the key commodity issues in the farm bill. This is so because of the central importance of export expansion as a result of this year's legislative decisions, and because price support programs for those commodities usually account for 80-90 percent of all CCC costs. If reductions in federal spending are required in the 1985 farm bill, support and payment levels for grains, soybeans, rice, cotton, and dairy products will have to be adapted to budget allowances somewhat lower than would be required if present programs were extended.

1. *Price support loan levels and the U.S. competitive position abroad.*—It is essential that loan rates for 1986 crops be reduced to give our growers a better chance in export markets. Language in the 1981 Act authorizing 10 percent cuts in loan levels when farm prices are low provides a good vehicle for this, except that it is optional. Secretary Block has passed up several opportunities to make our farm products more competitive under this provision. It would be better, in my judgment, if Congress would adopt a version of the so-called "soybean formula," setting loans at 75-80 percent of recent average farm prices. Language in Senator Helm's bill, the Farm Bureau bill, or the Administration bill could be used as the basis for this for-

mula. Congress could also provide yearly minimum loan levels for several years in the event reductions indicated under the formula seem too drastic. A minimum loan level, not the formula, has always set the soybean loan.

I suggest that a 10 percent average cut in loan levels in 1986, followed by 5 percent cuts in subsequent years, together with fiscal policies that reduce the dollar's value or at least stop its rise will go a long way toward creating a more competitive and profitable U.S. agriculture within a few years. That would provide roughly the following array of loan levels to 1988:

	1985	1986	1987	1988
Wheat (dollars per bushel)	3.30	3.00	2.85	2.70
Corn (dollars per bushel)	2.55	2.30	2.20	2.10
Soybeans (dollars per bushel)	5.02	4.80	4.70	4.60
Cotton (cents per pound)	0.57	0.51	0.48	0.45
Rice (dollars per hundredweight)	8.00	7.00	6.50	6.00
Milk (dollars per hundredweight)	11.60	11.10	10.60	10.10

I urge this Committee not to adopt a version of the "market loan" being proposed by a number of groups. That program would either leave market prices too high to be competitive abroad, or (if it functioned to allow lower market prices) could increase annual budget costs by up to $3-5 billion per year, further discrediting farm programs in the next few years.

2. *Payments; costs.*—Congress will need to set target price levels that are consistent with the budget, and will probably have to revise them from year to year to meet the annual budget targets for CCC outlays. There is no possibility of cutting the 1987 CCC budget to around $11 billion or $2 billion below the CBO estimate for "current services," without substantial reductions in 1986 target price levels. It would be helpful if target prices could be set by formula, but I doubt that application of a formula is practical when limits on overall spending are an overriding consideration. Maximum target price schedules along the following lines may be appropriate, if CCC spending must be cut by about $8 billion in the 1986-88 fiscal years, based on language that is before the Senate at this time in connection with the Budget Resolution.

	1985	1986	1987	1988
Wheat (dollars per bushel)	4.38	4.00	3.75	3.30
Corn (dollars per bushel)	3.03	2.75	2.60	2.40
Cotton (cents per pound)	0.81	0.73	0.69	0.65
Rice (dollars per hundredweight)	11.90	10.50	9.75	9.00

3. *Limiting payments.*—Payments to individual farmers should be limited progressively over the life of the 1985 Act. Large farmers generally have access to low cost inputs and highly productive technologies, giving them many advantages over smaller producers. The idea in the Senator Helm's bill provides a reasonable payment limit for 1986-89.

4. *Set-aside or acreage reduction.*—This program feature should be retained, despite its relative ineffectiveness. Set-asides at 20, 15, and 10 percent should be established for the 1986-88 crops (instead of the Administration's proposed 15, 10, 5 for 1986-88 crops), as long as target prices or other direct payments to farmers are continued. Such payments serve either (a) as incentives for increased output, if there are no conditions and everyone is eligible, or they can serve (b) as incentives for slight reductions in farm output, if eligibility is conditioned on reduced plantings. The phasing-down of acreage reduction would coincide with the declining target price payments schedule above, and would provide fairly appropriate incentives for participation year by year.

5. "Paid Diversion" served a useful purpose for over 20 years, but it is now obsolete. It once saved money, compared with further production of surpluses; now it costs money. Excessively high payment rates, inflated base acreages, and a combination of Congressionally-mandated loopholes and loose administration by USDA have destroyed the effectiveness of paid diversion. It should be terminated.

6. *Sugar; peanuts; tobacco.*—Equity considerations, and consistency in trade and deregulation policy require (a) that support levels for these three crops be at least

"capped," and then (b) reduced over time. Tobacco interests have recognized the need to reduce their support levels in order to get back into export markets. Sugar and peanut supports should not continue to escalate, and could be reduced progressively, until they fit reasonably well with support levels for other crops, permitting the U.S. to relax its stringent trade restrictions, especially on sugar.

7. Trade expansion features of a number of farm bill proposals represent only small steps toward agricultural trade expansion. Increased funds for P.L. 480 and export credits should be provided if budget policy will allow it. But export-PIK, bonus bushels, and similar approaches (a) represent only a stop and go approach to export expansion and (b) have the effect of pushing CCC-owned surpluses into markets that are already glutted, forcing new crop commodities back into government programs. The "road back" to increased exports requires much more than sporadic export subsidies.

8. *Farm credit crisis.*—The steps I have suggested to reestablish U.S. agriculture as a cost-competitive sector will neither materially help nor hurt the 43,000 farmers who are insolvent, or the 50,000 farmers with extreme financial problems (USDA Agr. Inf. Bul. 490). Most of those farmers will not be able to survive financially over the next 2-3 years. Even sharply higher supports would do them and some 100,000 other farms with very high debt/asset ratios little good. These farmers require tailor-made assistance, if any help at all can be devised, or they need a miraculous farm recovery.

The half million family-commercial farmers not in serious financial trouble will probably see the value of their assets decline further in the next few years almost irrespective of policy, as past speculative values are squeezed out of land prices. This will not be caused by the farm bill features I suggest for consideration, nor can it be avoided by any feasible policy actions. It is inherent in the present situation, which will improve only when fundamental adjustments have been made, costs have been reduced, and U.S. markets are again expanding because the U.S. umbrella of price protection for the rest of the world's producers has been lowered.

STATEMENT OF DR. MARVIN DUNCAN,* VICE PRESIDENT AND ECONOMIST, FEDERAL RESERVE BANK OF KANSAS CITY, KANSAS CITY, MO

Mr. Chairman and other distinguished members of the Senate Agriculture Committee, my name is Marvin Duncan and I am a vice president and economist with the Federal Reserve Bank of Kansas City. I am pleased for the opportunity to discuss agricultural legislation being considered by the Congress. The views and opinions expressed herein are solely those of my own and do not necessarily represent those of the Federal Reserve Bank of Kansas City or of the Federal Reserve System.

THE POLICY ENVIRONMENT

U.S. agriculture has reached a crossroads. It faces a more competitive world marketplace with slower growth in food and fiber demand than had been expected. To succeed in this environment, U.S. agriculture must price its products competitively and compete agressively for markets. Thus, in some respects, the needed change in direction for U.S. agricultural policy is quite clear.

In other respects, the appropriate change in policy is far from clear, for the vision of the future has been clouded by farm financial stress. The rapidly deteriorating financial position of heavily leveraged farmers has raised troubling questions about their survival. Should not the Congress reshape agricultural policy in quite a different direction—back toward high price guarantees and rigid production controls in an effort to save those financially troubled farmers? Proponents of that viewpoint seem willing to forego broader world market opportunities in exchange for that public utility approach to agriculture.

Despite the appeal, to some in the farm sector, of a highly regulated and subsidized domestic agriculture, at least two difficult problems would arise. First, American agriculture is a dynamic, changing industry. It has enjoyed marked productivity growth of about 1.75 percent a year for the past few decades. The promise of biotechnology research is that productivity will continue to grow, perhaps more rapidly than in the past. Currently, about two-thirds of U.S. farmers' cropland acreas are needed to produce food and fiber for domestic consumption. The combination of slower population growth in the United States and strong productivity growth in

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*The views and opinions expressed here are solely those of the author and do not necessarily represent those of the Federal Reserve Bank of Kansas City or of the Federal Reserve System.

U.S. agriculture point toward a time by the end of the century when only half of the current American cropland will be required for domestic use. In short, without growing export markets, U.S. farmers can expect sharp increases in excess capacity that will create escalating financial burdens for them and for the taxpayers that provide income transfers to farmers and pay higher food costs than might be available elesewhere.

Potentially higher food costs point to the second problem. It, as seems likely, continuing pressures for higher and higher farm commodity prices occurred in a regulated agriculture, U.S. prices would outstrip world prices—possibly by growing margins. On balance, a highly regulated agriculture would seriously damage U.S. agriculture's export market. That eventuality is widely recognized even by supporters of such a policy. Even more sobering, however, is the strong likelihood of growing competition from abroad in the United States domestic food and fiber market. The United States would then face an increasing need to protect its domestic markets against imported food and fiber products. Already some foreign producers match—and perhaps surpass—the efficiency of U.S. farm production. And, U.S. food and fiber product imports are currently on the increase.

Some agricultural spokesmen call for production regulation and high support prices as a means of saving the most financially troubled U.S. farmers. The probable loss of 90,000 to 100,000 farmers with debt-to-asset ratios of over 70 percent is decried. However, these farmers are rapidly losing equity in their businesses. Between 40 and 50 percent of them are already technically insolvent. Dramactically lower interest rates and sharply higher commodity prices in combination with rising land values would likely be required to save them. Given the magnitude of the financial peril they face, it seems unlikely that agricultural programs generous enough to save them can—or should—be enacted.

Those that would turn back by legislation the downward adjustment in commodity prices and asset values in U.S. agriculture misunderstand the role of 1970s inflation in creating excessive agricultural investment and commodity price escalation. They also ignore the inevitability of price and asset value adjustments to a more competitive world marketplace and a more price-stable economic environment. Policy can, however—and should—help moderate that adjustment process and avoid sharp undershooting of both commodity and asset prices below those supported by economic fundamentals.

The case seems clear from an economic perspective. U.S. agriculture will prosper in direct relationship to its success in capturing its share of growing world markets for food and fiber. Static world markets coupled with growing productivity in the sector would mean continued painful downsizing of American agriculture. Agribusinesses, on both the input and output side of farmers, are also dependent on growing export markets. With the agricultural sector, in its broadest definition, accounting for about 20 percent of the nation's GNP and employing 20 percent of its labor force, an agricultural policy that promotes market growth is also important to national economic performance.

NATIONAL POLICY

Before agricultural policy and program options are discussed, some comments on the role of national policy are important. That is true since it is probably not possible to offset the impact of adverse national policies fully by sector-specific agricultural policy. A number of issues come to mind.

The very large federal budget deficits of recent years add significantly to the inflation-adjusted cost of carrying debt and to the value of the U.S. dollar in interested exchange markets. Moreover, high real U.S. interest rates hold interest rates higher worldwide than would otherwise be true and slow world economic growth. The unusually expansive U.S. fiscal policy in the midst of an economic expansion has added to the burden of the nation's monetary authority in developing and implementing macroeconomic policy. The result of high federal budget deficits has been a large U.S. trade deficit and an uneven economic expansion with some sectors performing very well while more capital intensive and export dependent sectors, such as agriculture, lagging behind.

U.S. tax policy has encouraged investment in agricultural production capacity earlier and to a greater extent than market fundamentals would have justified. Farmers use of tax incentives, such as cash accounting, investment tax credit, and immediate expensing of certain developing costs has distorted both agricultural product and asset markets. But the tax sheltering of nonfarm income by investment in agriculture has been a much greater problem. Its effect can be seen particularly in production of livestock and certain specialty crops, where in some instances the impact of off-farm investment outweighs farmer investment decisions in determining supply and price. In the past decade, the conversion of fragile range and grass lands—usually subsidized by government farm programs—to irrigated and dryland cropland also has been evident.

At a more macroeconomic level, many economists believe federal tax relief for business has helped make this country a prime investment opportunity for foreigners. If true, that has added further to the strength of the U.S. dollar in international exchange markets. Indeed, some economists are now asking whether lower taxes on business investment in other industrial countries might help to ease the dollars' value.

Finally, as the United States becomes more dependent on international trade to support its economic growth, a particularly complex problem takes on added importance. From time to time, the national security and foreign policy objectives of the United States conflict with its trade objectives. The Russian grain embargo of the late 1970s, the Russian gas pipeline embargo of the early 1980s, the allocation of P.L. 480 food assistance, and continuing discussion over U.S. cargo preference legislation are all cases in point. How those conflicts are resolved when they arise, will become more and more important to U.S. trading sectors vying for world markets in an increasingly competitive environment.

AGRICULTURAL POLICY

As the Congress and their nation's agricultural leaders have studied agricultural policy options, some views have converged. First, there has been growing appreciation that national policies outside of agriculture are unusually important to the sector's improved wellbeing. That means farm legislation cannot solve all of agriculture's problems. Second, in a more competitive world marketplace, market clearing farm commodity prices are not only critically important signals to foreign producers and buyers but also an indication to U.S. producers of the challenge ahead. Finally, new agricultural legislation must spend public resources more effectively. Agricultural legislation will be expected to make a contribution to federal budget deficit reduction.

The real issue in the agricultural policy debate is not if, but rather when and how, policy will become more market oriented. The current farm financial stress coupled with the likelihood that economic recovery in the farm sector may be two to four years away poses the need for an imaginative multi-year adjustment assistance program for farmers. Lacking such assistance, farmers will not accept the concept of market pricing. But, that concept is critical both to a new direction for agricultural policy and to the longer term wellbeing of U.S. farmers.

In evaluating alternative legislative proposals before the Congress, I will concentrate my remarks on agricultural credit, loan rates and target prices, acreage reduction, and exports.

Agricultural producers that carry heavy debt—in the current environment, debt-to-asset ratios of more than 40 percent—are having varying degrees of trouble in servicing their obligations. About 90,000 to 100,000 commercial family farmers are so indebted with debt-to-asset ratios of more than 70 percent, it is unlikely they can survive beyond a couple of years. Another 130,000 to 140,000 farmers, with debt-to-asset ratios of between 40 and 70 percent are having some problems but most of them can be saved with debt and asset restructuring, provided their asset values do not plunge far below about half the value of the market high in 1980–81. For those farmers that can be saved, the Farmers Home Administration (FmHA) debt adjustment program can provide timely and valuable help.

Extending FmHA assistance to restructuring real estate debt, in addition to non-real estate debt, is an important part of that adjustment assistance. Programs that facilitate the transfer of land from weaker to stronger hands and that prevent undue amounts of farmland on the market that depress land values far below their economic worth would provide needed stabilization to rural America. Farmers, lenders, and rural communities would all benefit. The FmHA debt adjustment program could, I believe, fulfill a role in that process. If precipitous land price declines were to continue well into the future, it might be useful to consider facilitating formation of an entity—maybe with partial federal capitalization—to acquire troubled farm real estate and hold it for a few years.

In a longer time frame, it seems reasonable to shift FmHA lending increasingly to loan guarantees rather than direct lending. Such guarantees should be of limited duration, perhaps with the guaranteed proportion to decline over the guarantee period. Tighter focusing of FmHA credit guarantees to beginning farmers for farm ownership and operating expenses and to limited availability for other family farmers on a lender of last resort basis would help avoid mistakes of the past and return the agency's lending activities to the purposes originally intended. Where crop insurance is available, FmHA disaster loans are probably not necessary. When disaster loans are made they should be in the form of loan guarantees and for limited periods. Interest rates on guaranteed loans might start out no lower than the cost of loan funds to the government and rise during the term of the loan guarantee to commercial rates.

Many think rural development lending by the FmHA should be phased out, and they may be correct. It appears that FmHA's authority became too broad during the 1960s and 1970s for the agency to manage well with its limited resources. Yet the pace of change in rural America is quickening and the adjustments for many rural residents will be traumatic. At some point, greater public sector support for retraining and rural development activities may be useful. For example, retraining and relocation benefits for displaced farmers could ease their adjustment into a new vocation.

Commodity Credit Corporation (CCC) loans represent another source of credit to farmers. When collateral is turned over to the CCC in full settlement of a nonrecourse loan, CCC loans have the potential for substantial public subsidy. To reduce this subsidy, a cap could be placed on the amount of nonrecourse loans available to a farmer in a given crop year, and interest could be charged, a farmer on defaulted loans. If farm subsidies must be reduced, many crop farmers would prefer the proposed $200,000 annual limit on nonrecourse loans with only recourse loans available above that limit, rather than a very low cap on government payments. Such a nonrecourse loan cap serves to direct loan benefits, to family farmers.

Proposals to set CCC loan rates for wheat, feed grains, cotton, rice, and soybeans at a proportion of the moving average of recent years' market prices are fundamental in shifting to a more market-oriented farm policy. That change in CCC loan rates should be made promptly. The language of either the administration or the Helms bill would accomplish that shift. CCC loans at 75 to 85 percent of market prices would send clear market signals to U.S. producers and avoid building large corps stocks locked from the market by unrealistically high prices. The policy shift would also send a message to offshore producers that the United States intends to compete aggressively in world markets.

An immediate adjustment in CCC loan rates should be made, but would likely result in lower receipts for crop producers until world demand growth picks up tempo. Thus, some combination of target price payments and acreage diversion payments—income transfer payments to farmers—to offset much of the lost cash receipts may be required to satisfy farm groups, especially early in the adjustment period. That also implies, I believe, that the current $50,000 limitation on government payments be maintained for another one to three years, to induce participation in programs by commercial farmers who account for most of the U.S. crop production. After that, payment limitations could be reduced to no more than median family income—both to limit federal budget exposure and for equity considerations. But moving too quickly in sharply reducing target price payments would likely result in a stalemate on the legislative package and jeopardize the critically important concept of market pricing for U.S. commodities in international trade.

It seems wise to retain legislative authority for acreage limitations, set asides, and paid diversion. These could be exercised at the Secretary's discretion, but with some limitations on the amount of commodity price improvement to be achieved in a given year. U.S. agricultural production capacity is currently substantially larger than can be marketed domestically or in export markets without sharp reductions in market prices, at least until export demand growth improves.

A multi-year program of land retirement, aimed first at fragile lands, seems prudent given the prospective U.S. crops supply/demand balance for the next few years. About 25 million acres could probably be removed on a bid basis. To do so would somewhat reduce production capacity, enhance soil conservation goals, and cushion somewhat the downward adjustment in farm real estate values.

The anti-sodbuster language in both the administration and the Helms bills responds to a popular theme among farmers. It also makes sense to conservationists and economists. While it may not be appropriate for government to prevent landowners from converting fragile lands to intensive cultivation when economic fundamentals justify more production capacity, it seems clear that government subsidization of crop production has spurred land conversion, been costly to taxpayers and farmers, and damage to soil resources. Thus, withdrawal of government subsidies for a number of years after conversion seems a good approach. Linking government crop subsidies to the use of appropriate conservation measures is also overdue.

Export development, along with market pricing, are the essential agricultural policy initiatives required to turn around the fortunes of the financially troubled agricultural sector. Proposed legislative changes recognize a legitimate role for government credit and credit guarantees in meeting competition from other producers in the world. Intermediate credit is appropriately singled out for increased emphasis. Efforts to reduce large CCC stocks also seem useful. Policymakers should proceed cautiously, however, in the area of competitive subsidization of exports. Bilateral and multilateral negotiations seem preferable, where possible.

Policies outside agriculture, as previously noted, are major factors in U.S. export competitiveness. Changes in those policies, coupled with market pricing for U.S. agricultural exports, and improved world economic growth will spur export demand. The future growth markets for U.S. agriculture will be found increasingly among low- and middle-income countries that have high population growth and high income elasticity of demand for food and fiber. Conversely, Japan and western Europe represent relatively mature markets where growth in demand will likely slow.

It is heartening to read proposed legislation directed at using U.S. surplus commodities and P.L. 480 fundings to enhance economic growth in target countries. That is a good start. In the past, the United States has had impressive success in turning such concessional markets into commercial markets. But, the task is large. A major long-range strategic development assistance effort to spur economic growth—and as a result, food and fiber demand—in low- and middle-income countries is essential to the long-term profitability of U.S. agriculture. Without such a program it is quite unlikely world market growth during the rest of this century will be rapid enough to provide acceptable growth in agricultural export opportunities and in farm income. In a world of static demand growth—or even if growth were slow—U.S. domestic protectionist pressures would be difficult, if not impossible, to contain. Conversely, such a development effort could add broadly to demand growth for U.S. products while at the same time making a very positive contribution to political stability and living standards around the world.

SUMMARY

In summary, agricultural policy is at a crossroads. Agriculture's interests will be served by moving forward with market oriented agricultural legislation. But the fragile financial circumstances of many farmers and agribusinesses call for more generous and longer term government assistance to ease the transition than had earlier been thought necessary. Appropriate national policy choices also must be made, if longer term agricultural markets are to brighten materially. Finally, the best growth markets for U.S. agricultural products will be in what are now the low- and middle-income countries of the world. A carefully conceived, strategic policy of development assistance for these countries could return substantial dividends in economic growth for U.S. farmers and agribusinesses.

STATEMENT OF DR. D. GALE JOHNSON, DEPARTMENT OF ECONOMICS, UNIVERSITY OF CHICAGO, CHICAGO, IL

The most accurate projection of the economic outlook for U.S. agriculture is that it is hazy. It is hazy because of the many factors outside the general framework of agricultural policy that have major consequences—either positive or negative—upon the prosperity of agriculture. It is hazy because new farm legislation can work either to facilitate the adjustments that must be made in agriculture or to delay those adjustments until well into the 1990s. What is subject to rather little uncertainty is that there are now more resources in U.S. agriculture than can find employment at earning levels comparable to what these resources can earn elsewhere in the economy. This is true of both labor and capital and it is probable that there will have to be a further decline in the value of farm land.

How large the required adjustment in resources will need to be and how well it will proceed will depend upon two sets of major uncertainties—the macroeconomic variables and the structure of the new farm legislation. The four interrelated main macroeconomic variables are the interest rate, the foreign exchange value of the dollar, the rate of inflation, and the general level of economic activity. The rate of inflation is included because the real value of the current farm debt, which was entered into in part because of inflationary expectations, could be sharply reduced with a return to high rates of inflation.

It has become quite apparent that traditional agricultural policy measures such as target prices, price supports and supply management can have little positive effect upon farm incomes for longer than a year or two. Setting target prices at a high level, as was done for some commodities in the Agricultural Act of 1981, soon leads to the need for supply management, a euphemism for output reduction. Similarly, setting price supports at or above market clearing levels soon leads to the United States becoming a residual supplier in international markets and the accumulation of stocks in the farmer-owned reserve or by the Commodity Credit Corporation. In either case, as these stocks reach costly levels, supply management must once again be resorted to.

I have elsewhere argued that the 1981 Act was a careless piece of legislation (Johnson 1984). I said this in the context of the high budgetary costs, which have been several times those anticipated, of the loss of international markets because the price supports made us the residual supplier, and because of the legislative failure to permit any significant degree of flexibility to respond to changing conditions such as the sharp increase in the foreign exchange value of the dollar. The blame, I believe, was upon the Administration as well as the Congress. Some have claimed that the legislation was not carelessly drawn but that there were those in Congress who well understood what they were doing. The high target and support prices were expected to result in substantial deficiency payments and high governmental costs unless the international and domestic markets for farm products were very strong. If the markets were not strong, the appropriate response was supply management and output reduction. Thus, it could be argued, the high target and support prices were not set in error and, in fact, had the intended consequences. If accurately described, this policy position follows from a lack of confidence in the ability of the American farmer to respond to changes in economic conditions. It also assumes that the measures the government can take will have desirable consequences for farmers. The validity of this description of Congressional intent is supported by the minimal changes that Congress has been willing to make in target and support prices even when the evidence is at hand that the costs of continuing with the mandated prices would be enormous and the benefits very small.

SUPPLY AND DEMAND TRENDS

While a considerable share of the responsibility for the recent difficult economic circumstances of U.S. agriculture can be put upon the macro-economic policies and variables and upon specific agricultural policies, we should not entirely ignore the underlying trends in the relative rates of growth of world supply and demand for farm products. I refer to world supply and demand because, with but few exceptions, our farm prices reflect world conditions. With our exporting the output of more than one out of every three cropland acres, the price trends for U.S. agriculture are strongly influenced by world trends. There is no escape.

True, how the international prices are reflected back to our farmers is affected by exchange rates. All other things constant—which they would not be—if the foreign exchange value of the dollar today were the same as it was in 1980 U.S. farm prices of crops would be about one fourth higher than they now are. Obviously if our prices were that much higher than they are now, we would not have had PIK in 1983 nor would we have had the accumulation of farm products in stocks that we had in 1982. Thus instead of being a fourth higher, the difference might be more of the order of a sixth higher. But whatever the exact figure, with a lower foreign exchange value of the dollar, our farm prices—in U.S.$—would be higher than they now are. Similarly, as we look ahead, any given balance of world supply and demand existing at a particular time will mean different U.S. farm prices. While I am convinced that the foreign exchange value of the dollar will fail, I do not know when or by how much. Nor do I know any one who does know.

In recent years there have been a number of projections of the rates of growth of world demand and supply for food. Since grains account for such a large share of the calories consumed by the three fourths of the population living in the developing countries, the projections tend to emphasize grains and trade in grains. The projections, however, are no better or worse than the assumptions used. There has been no consistency in the assumptions used. The projections range from those included in "The Global 2000 Report to the President" that raise the specter of sharp increases in real food prices between 1970 and 2000. The lowest projection of real price increase was 30 percent; the highest in excess of 100 percent. Please note that nearly half of the time period has passed and the international real prices of cereals are now below the 1970 level.

In my opinion, the most realistic projections of the world food situation at the turn of the century are to be found in a much neglected report of the Food and Agriculture Organization (FAO)—"Agriculture: Toward 2000." This report, which was available in preliminary form prior to the publication of "Global 2000," has received almost no attention in the world press. The only reason for this, I fear, is because it does not predict gloom and doom; it does state that there are difficult problems to be solved and then presents alternative ways of meeting those problems. But perhaps its greatest sin, in terms of getting attention in the popular press, is that it states that if recent trends persist until the end of the century there will be some small improvement in the food situation in the developing countries. With trend projections of agricultural productions and national incomes the percentage of the population classified as "seriously undernourished" would decline from 23 percent in 1975 to 17 percent in 2000. With a series of modest changes in policies and investment agriculture in the developing countries, the percentage malnourished in 2000 might decline to 11 percent and with changes that imply additional emphasis upon agriculture, to 7 percent.

But from the standpoint of the agriculture of the United States and the other major exporters is the following conclusion (FAO, pp. 24-25):

"A continuation of production and demand trends world-wide implies large global surpluses in some commodities, despite the growing millions of seriously undernourished, and deficits in other, mainly livestock products. Thus the net surplus of cereals of the developed countries would tend to stand at 213 million tonnes at a time when the developing countries would have a deficit of 165 million tonnes. Projected net availabilities from the developing countries of such competing products as sugar, citrus fruit and vegetable oils and oilseeds would substantially outstrip import demand in the developed countries, whose continued protectionism would limit severely any expansion in their imports of these products.

"All in all, the tendency is for global surpluses worth roughly $20 billion 1975.

"The projected imbalances will not actually materialize; spontaneous or policy-induced adjustments will bring balances. The policy issue is how orderly adjustments can be brought about. They should increase rather than reduce trade—the developing countries should be able to import and consume more of the cereals produced in the developed countries and help pay for them with increased exports of the commodities they are best suited to produce. Such an evolution would eliminate the irony in the situation of the world afflicted with under-nutrition, but where there is a danger of global surpluses."

Other projections could be referred to. I will note only three others. The International Wheat Council (1984) issued what can be considered a very pessimistic report, at least as viewed by grain supporters, that world grain trade between 1980 and 2000 would increase by an annual growth rate of just 1.2 percent. The U.S. Department of Agriculture (1982) has presented a more optimistic view, namely that during the 1980s world grain trade might increase at an annual rate of 2.7 percent. The guesstimate is consistent with my analysis that a growth rate of 3.0 percent is a realistic expectation. However, the 3.0 percent growth rate must be compared to the 7.5 percent annual rate of the 1970s.

The most recent projection that I have seen comes from Resources for the Future. Without going into the details of their projections, let me quote from their summary (p. 19): " * * * the productive capacity of U.S. agriculture has expanded a great deal in recent decades, and we see no reason for the process to come to a halt. On the contrary, it can be further expanded * * * we believe that the United States can readily sustain increases in output to meet projected global demand for its products to 2000 at real prices in the neighborhood of those of 1979-81."

The output increases for 1980-2000 underlying this summary statement are 30 to 40 percent for grains and oilseeds and about 20 percent for other major products. U.S. agricultural production increased by almost 40 percent from 1960 to 1980; thus projected growth of output for the last two decades of the century is somewhat less than achieved during a recent similar period.

I have for more than a decade predicted that the most probable course of grain prices, adjusted for inflation, was a continuation of the gradual decline that has been evident for almost all of this century (Johnson 1974). The increase in real grain prices during 1973 and 1974 was very short lived; by 1977 our export prices for wheat and corn had returned to the low levels of 1970. Even a massive PIK and a serious drought in the American heartland in 1983 hardly interrupted the downward trend if one looked at the futures markets. I can see no evidence that would support the view that the downward trend in real grain prices is likely to be reversed in the next decade or so. It is possible, of course, that the trend can be interrupted for a year or more, as it was in the 1970s, but we should not once again misinterpret such an interruption as the beginning of a trend toward long run higher prices. To do so would have disastrous results for American agriculture.

ECONOMIC SETTING FOR NEW FARM LEGISLATION

If there is a sincere interest in the long run economic health of American agriculture and the well being of American farm people, the 1985 farm legislation must recognize that U.S. agriculture now has the capacity to produce more farm products than can be sold at prices that would provide reasonable incomes. It is not possible to say how great the excess capacity is since its size depends upon certain macroeconomic variables, such as the foreign exchange value of the dollar, interest rates, and the level of economic activity in the rest of the world. But if all of these variables move in a way favorable to the markets for our farm products, it is unlikely that we would return to a more favorable economic climate for agriculture than prevailed during the late 1970s. At that time the foreign exchange value of the dollar was at an all-time low, world stocks of grain, oilseeds an sugar started from minimal levels, and the Centrally Planned Economies were rapidly expanding their imports of grain.

A fundamental requirement for the new legislation is that it assist farmers to adjust to changing conditions and not stand in the way of necessary and desirable adjustments. It is not only the content of the new legislation that is important but also the kinds of signals that will emanate from Washington. These signals can be of several kinds. One kind is the unbridled optimism that exuded from Washington during the Carter administration—our farm problem is to produce enough to meet demand. Another kind of signal is that government will always be ready to help—with payments, price supports, credit relief—when there is some downturn in prices and incomes. A third, more subtle, and more worrisome signal might be that world trade for farm products is so unfairly organized and adverse to our farm exports that the only road to farm prosperity is to manage both production and marketing of farm products, especially exports. Such a signal implies that the route to economic salvation is governmental intervention on a large scale, not through lowering costs and meeting foreign competition without the hindurance of price supports that make us a residual supplier and encourage our competitors to increase production with the protection of our price umbrella.

The new legislation must be consistent with the economic realities that our farmers face. The legislation should be such that it transmits honest signals to farm people. All too often, the political process sends the wrong signals because the wrong signals are more palatable, in the short run, than the correct signals would have been. It is much more conforting for the politician to give speeches promising a rosy future with demand growing faster than supply than it is to stand up and say that we have mistakenly told you to produce, produce, and produce some more and now you have to pay the price for our misleading you.

If we take a realistic view of the current situation, we must recognize that the growth of farm production must be at a slower pace for the next few years than it has been for the past decade or so. Market prices must be permitted to seek the level at which demand equals supply. This is true not only to provide the appropriate signals for our farmers so that thay can make the decisons that are best in terms of their own interests—what to produce, how much to produce, how to produce, or whether to produce at all. But we must also send the proper signals to farmers in other countries. Now our farmers are losing markets because the farmers in other exporting countries expect the United States to hold an umbrella over world market prices. And, until now at least, these expectations have been correct.

THE 1985 FARM LEGISLATION

My remarks will be concentrated on the commodity programs for the grains, cotton and dairy, with a few side references to tobacco, peanuts and sugar. But there are many other important aspects to farm policy—credit, crop insurance, research and extension—that I shall completely neglect.

I do want to say something about federal income taxes as they relate to agriculture. I suspect that there are among you those who believe that the provisions of the current federal income taxes as they relate to agriculture favor investment and thus are a positive element in the demand for farm machinery and equipment. There probably is some effect of this kind, but I would speculate that the income tax provisions applied to agriculture have the effect of making the cyclical demand for farm equipment and machinery highly variable.

But primarily I want to use the federal income tax provisions for agriculture as illustrations of the harm that can be done when trying to do good. A recent study by the U.S. Treasury indicates that total federal revenue from income taxes would increase if all agricultural income were excluded from income tax. Many farmers do pay income taxes upon their agricultural income but the writeoffs against taxes on income from nonagricultural sources due to losses in agriculture are nearly twice as great. In other words, the savings on income taxes by those who have both farm and nonfarm income sources are substantially greater than the taxes paid by those reporting positive net income from agriculture. Who benefits from these arrangements? It certainly is not the full-time farmer who has little or no other income to counter balance losses from farming operations. The primary beneficiaries are people seeking tax shelters. Unfortunately, the tax shelters plus the general encouragement of investment in agriculture, such as special capital gains treatment or the use of cash accounting that permits writing off an investment in a year of high income, result in bringing new capital into a sector that already has more resources than can find profitable employment in the absence of governmental support and subsidies.

As one very prominent elder statesman among the agricultural economists and a former important policy official in the U.S. Department of Agriculture said so succinctly in outlining a policy agenda for agriculture (Cochrane, p. 14):

"Overhaul the tax system so that the farm sector is no longer the prime tax shelter of the economy. This is necessary to help slow down the resource concentration process in farming, and to assist legitimate full time farmers to compete successfully in farming operations."

It is my hope that in 1985 we will take a look at all of our policies and programs that distort our use of resources through providing inappropriate incentives.

There is now a degree of unanimity among prominent agricultural economists, including those who have served as important policy officials and advisers for every administration from Eisenhower to Reagan, that the present price support, target price and deficiency payment programs are more harmful than helpful to American agriculture. Let me list a few such individuals—Don Paarlberg (Eisenhower and Nixon), Willard Cochrane (Kennedy and Johnson), John Schnittker (Johnson), Dale Hathaway and G. Edward Schuh (Carter) and William G. Lesher (Reagan). Such unanimity if expressed, often in rather forceful language:

"Eliminate completely all of the Commodity Programs in the existing legislation. * * * The Commodity Programs no longer serve their intended purpose, namely to provide effective economic assistance to small and medium sized farmers, as well as large farmers, in periods of farm depression" (Cochrane, p. 1).

"Commodity programs as we have conventionally understood them have probably outlived their usefulness. Given the changes in our economy, they can probably bring about more stable prices and farm incomes only at the expense of very high budget costs. * * * I suggest that we move away from community programs as quickly as we can deal with the corresponding adjustment problems" (Schuh, p. 18).

The most important objective of farm legislation revisions is that our actions should facilitate our being an effective competitor in international markets. We are a low cost producer of many farm products yet the policies followed in recent years all too often make it very easy for our competitors to undersell us and transform us into a residual supplier. Whenever we accumulate stocks as a result of our price supports, whether it is in the farmer-owned reserve or the CCC stocks, this is a signal to other exporters that it is relatively easy to take business away from U.S. exporters. And this is what has happening with grains during the past two years—we have absorbed almost all of the decline in world trade in grains that has occurred. In the case of wheat, other exporters have actually increased their exports while total world exports have declined somewhat.

There are good ways and bad ways of meeting this problem. One of the bad ways is to engage in an export subsidy war, either through direct export subsidies or highly subsidized credit. Such efforts will be matched by others; it is of little value to note that there are those now providing export subsidies, such as the European Community. One of the reasons the EC has access to the use of export subsidies is that a quarter centry ago we refused to support the inclusion in GATT of a prohibition against all uses of subsidies used to increase exports; we demanded and got an exception for primary products. One's past sins come back to haunt one.

The good ways involve reducing prices supports to levels that will seldom directly influence maket prices; the price support would then serve primarily as readily accessible credit to aid farmers to market their products in an orderly manner. It also includes accepting the conclusion that U.S. farmers have very little to gain from supply management or output limitations. Any short run gains of higher prices will be largely, if not wholly, offset by encouraging producers in other countries to expand their production.

We have had one "successful" supply management program in agriculture—the tobacco program. Tobacco farmers, contrary to the stories one sees in the national press, have received little in the way of governmental subsidies. Prices have been maintained by restricting production. The consequences have been several. Tobacco production is smaller today than it was two decades ago. The U.S. has lost a large share of the world's export market (Seagraves). Our share of the world production of flue-cured tobacco has fallen from 64 percent in 1935-39 to 18 percent in 1980-82; our share of world exports has fallen from 83 percent to 21 percent. As late as 1960-64 we still supplied 51 percent of the world's exports of flue-cured tobacco. In terms of quantity, the United States has become the world's largest importer of tobacco. The high U.S. tobacco prices combined with the poundage (and high priced) tobacco and have foregone the production of low quality tobacco. It is hard to believe that our farmers could afford more than one "successful" supply management program!

Another appropriate way is to continue to press for trade liberalization, not only for agricultural products but for labor intensive manufactured products. But if we are to be successful, as we have not been in the past, we must finally get our own house in order. The GATT waiver that we asked for in 1955—and got—makes it difficult for us to argue with others about their quantitative restrictions (import quotas, variable levies) used to protect not so much their farmers as the integrity of their domestic price support schemes and to hold down financial costs. The general GATT principles are that quantitative restrictions should not be used. There are exceptions made for agricultural products if domestic supply is restricted and imports are adversely affeceted only to the same degree as domestic production. But we were not willing to abide by this exception in the case of dairy and we got a general waiver to permit the use of import quotas whenever imports threatened to increase our price support costs. We now have import quotas on dairy products, sugar, peanuts and legislative authority to impose them on beef, veal and lamb. We have not imposed them on the latter, but instead have induced our suppliers to impose so-called voluntary export restrictions upon themselves.

Our high price supports for sugar have an interesting ramification in our conflicts with the European Community. In the Kennedy Round the EC agreed to bind at zero or very low levels the duties on soybeans and a number of nongrain feeds, such as corn gluten meal and manioc. The importation of the nongrain feeds has now reached 16 million tons from nil levels in 1960. The EC wants to restrict the importation of corn gluten meal to roughly its current level of 3 million tons. We are objecting very strongly even though most of our production of corn gluten feed is due to one or the other of two subsidies—the high protected price of cane and beet sugar (made possible by an import quota) which makes high fructose sugar production profitable or the subsidies for alcohol as a fuel. The corn gluten feed is a byproduct of both processes.

I do not believe that we can immediately go from the current level of price supports to those that will make us competitive in world markets and thus maximize the advantages from our production efficiency. To do so would cause substantial income losses and great financial difficulties for many farmers. A transition period of significant length, such as four or five years, is required for resource adjustments to occur. While in the longer run the target price concept is easily subject to political abuse, in a transition period it could be a useful tool. I suggest that target prices be maintained at their 1985 level through 1990, that deficiency payments be paid on a declining percentage of the difference between the actual market price and the target price, and that the payment not be related to current production but to the average production of a recent period such as 1982-84. In other words, the payment should not be an incentive to increase output. The deficiency payments should follow a declining schedule, such as 80, 60, 40, 20 and 10 percent of the difference between the target and actual market price. After 1990 there would be no target price system.

There are some equity problems in this suggestion, both among crops and among farms. Target prices have been much higher relative to market prices for wheat than for the feed grains, for example. But perhaps the most difficult problem relates to the farms that have participated in the supply management programs in recent years and those who have not. The schedule indicated above might apply to farmers that had participated in the programs in at least two out of the three years with a reduction in the payments for farms that had been in the programs only one year. For farms that had not been in the programs in any year, the deficiency payment might be based on the difference between the 1985 support prices or loan rates and the actual market prices for 1986-90 with a declining schedule of payments. In this case as well, payments should be related to past output and not current output.

CONCLUSION

I make no claim that the 1985 legislation would move so directly to full market orientation as the proposal that I describe would imply. Nor does the proposal that I have made to issues in dairy, sugar or peanuts. In these cases, as well, we should move toward trade liberalization and greater market orientation. In dairy, at a minimum, we should have price supports that result in self sufficiency and not substantial surpluses over domestic utilization. It is really not possible for us to espouse a liberal trade position with our current protection of sugar production; our very restrictive policies are for the benefit of at most 12,500 sugar producers and a small number of sugar processors and refineries.

There are two compelling reasons for a move toward greater market orientation in U.S. agriculture. One is that the budgetary cost of a continuation of existing policies, as exemplified by the 1981 Act, will be so great as to require Congress and the Administration to view agricultural programs more carefully than was done in 1981. The 1981 Act was passed with the expectation that annual costs would average no more than $4 billion annually; in FY 1982 the cost was $12 billion and in FY 1983 $19 billion for price support functions. These figures do not include food, and nutrition nor foreign food aid. The Congressional Budget Office projects that if the 1981 Act were to be continued through 1988, the annual budget expenditure might average $12 billion.

The second, and most important, reason is that it is in the best interests of the vast majority of U.S. farmers to move toward greater market orientation. A continuation of price supports at recent levels will continue the erosion of our share of export markets for wheat, feed grains, rice, cotton and tobacco. As this erosion continues, government payments cannot be large enough to offset the costs involved and the loss of income opportunity due to the acreage reduction that would be required to keep stocks of these commodities from increasing to levels that were unsustainable. U.S. farmers are efficient and are low cost producers of a wide range of products. As a result of misguided governmental programs we are in danger of losing the enormous potential of American agriculture in producing large quantities of food and other farm products at low cost but with good incomes for the resources involved. It is clearly in our national interest and in the interest of the vast majority of farmers to press hard for liberalization of trade in farm products. To have some chance of success in this endeavor we must make our own farm policies consistent with the principles of liberal trade.

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